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An asterisk* indicates a peer-reviewed paper

Front cover: Bilateral gynandromorph Orange-tip *Anthocharis cardamines* found at Askham Bog (VC64 Mid-west Yorkshire) on 13 June 2016. Photo: *Mark Coates*

Back cover: Leeds University MSc Biodiversity and Conservation students at the training day on identification skills given by the YNU, September 2016. Photo: *Judith Allinson*

The Naturalist

Sarah White, President of the Union 2016-17

My childhood was spent in suburban Birmingham, perhaps not the most promising start for an interest in natural history, but my father loved the countryside and particularly birds, so we had wonderful trips into rural Worcestershire at weekends, and to the Welsh Border country in search of Buzzards, then confined to the western fringes of the midland counties. I saw Kestrels in the Birmingham suburbs - they nested on the church opposite my school and were a distraction from lessons - but it was many years before I saw a Sparrowhawk or a Peregrine, both city birds now. Summer holidays were all UK ones in those days and a favourite was Norfolk, sailing at Blakeney and birdwatching on the saltmarshes. I was inspired by reading RSPB stories of returning Avocets and Ospreys and joined the YOC, winning a book about Kingfishers on the river Test, which showed me all birds I had yet to see.

From Birmingham I progressed to Cambridge and a Natural Sciences degree. The short terms and demanding academic work left little time for much else, but I remember coppicing at Hayley Wood with Oliver Rackham, cycling to Wicken Fen to see a Great Grey Shrike and the first of many visits to the WWT at Welney.

Determined to pursue a career connected with wildlife, I went to Durham to do an MSc in Ecology and made my first acquaintance with the wonderful North Pennine dales of Teesdale and Weardale. Our field course was to the North-west Highlands and I was overwhelmed with

the wildness and richness of Torridon and Inchnadamph. My supervisor was the late Peter Evans, a superb ornithologist and conservationist.

Then, at last, the road led to Yorkshire and a graduate studentship with Michael Usher in the Biology Department at York. I had managed to survive my MSc at Durham without gleaning much botanical knowledge and it was thanks to Michael that I eventually learned my plants. He was very active in the then YNT and I got to know Stephen Warburton, the Field Officer, who lived round the corner from me in Heslington. Through him I became involved in the campaign against navigation rights on the River Derwent.

When the time came to find a job, I was fortunate that the Nature Conservancy Council was looking for a number of new Assistant Regional Officer posts and I was offered one in the York office with responsibility for the county of Humberside. This was a wonderful time – exploring the fabulous habitats of the East Riding with the help of knowledgeable naturalists who were so generous with their time, their knowledge and their hospitality, like Brian and Shirley Pashby, Derrick Boatman and Eva Crackles. A major project was the survey and extension of the Derwent Ings SSSI to protect the flood meadows against agricultural improvement. This also led to the land purchases which were the start of the Lower Derwent Valley NNR. It was at this time that I worked with John Bowers, who advised us on the economic arguments against land improvement, a pioneering field.

I would have been very happy to stay longer in Humberside, but after 5 years I was moved to the Yorkshire Dales and set up an office in Leyburn, initially single-handed, then joined by an expanding team. We worked closely with the National Park Authority and completed a Phase 1 survey in which the best hay meadows were identified. We also purchased land on Ingleborough, to extend the existing NNR at Scar Close.

The job moved again, briefly to Cumbria and then to Newbury, where I still live. By this time, though, it had become managerial and less enjoyable, and so I reduced my hours to enable me to do a part-time degree in the History of Art which was a refreshing and enlightening change. When this finished, I attended birdwatching classes led by Ken White, an inspirational soul-mate, who is now my husband. Bird surveys are an important part of our life and we are joint BTO Reps for Berkshire. We make frequent trips abroad, including an annual pilgrimage to southern Spain for the raptor migration across the Straits of Gibraltar. I also keep up my botany with survey work for the BSBI Atlas 2020. I work as a Teaching Assistant in a local school and I have recently written a book on the wildlife of the school grounds. We would love to spend more time in Yorkshire – at the moment it is largely restricted to the VC61 Excursions which we organise – but retirement beckons and we may, before long, have more time to spend in that wonderful county.

Moth trapping for 'river flies'

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Introduction

Our recent initiative through the YNU Freshwater Section is to encourage Lepidoptera recorders and others to record adult mayflies (Ephemeroptera - E), stoneflies (Plecoptera - P) and caddisflies, also referred to as sedges or sedge flies (Trichoptera - T) from their light trap 'by-catch'. Thus the acronym EPT, used in this article, refers to these three groups collectively.

Somewhat confusingly these three taxa are often referred to as 'river flies' either individually or in combination, especially by the angling community. Not all of them, however, are associated with rivers so it is difficult to come up with an all-encompassing, meaningful term for this rather artificial grouping. The EPT acronym has been widely used in the scientific literature as the ecology of these taxa has usually been studied in combination in river systems, at least in their juvenile stages. This has inevitably seeped into the small number of academic studies (at least in the UK) on the adult ecology. Feeding, dispersal, swarming, mating and oviposition are all aspects of the ecology of the adults which have been very sparsely investigated here in the UK. Information, therefore, about where they occur and an indication of numbers could be a very useful starting point for further investigation.

Adult ecology

It has been generally believed that these animals are poor fliers and, therefore, poor dispersers. The findings of some researchers, however, have shown that distances of up to several kilometres are travelled by adult stoneflies (Kuusela & Huusko, 1996). It has also been shown that adult caddisflies migrated some 16km upstream from their emergence sites (Coutant, 1982). Petersen *et al.* (1999) showed that very few stoneflies and caddisflies dispersed laterally as far as 75m from the stream channel. Even these small distances could be important to reproductive success in a patchy environment. We need to understand what the adult habitat requirements are, where they lay their eggs (oviposition site choice), whether and what some of these species eat or imbibe as adults. Adult feeding is a prerequisite for successful completion of the life cycle for many stoneflies, particularly females (Hynes, 1942; Zwick, 1990). Stoneflies are known, from gut content analysis studies, to ingest lichen and algae (from tree bark). Caddisflies and mayflies do not possess chewing mouthparts but mayflies have been observed to imbibe sucrose solutions when offered them in feeding experiments. Feeding also has an effect upon egg maturation.

Recording 'river flies'

It is crucial to recording that reliable identifications are made so that more comprehensive distribution maps can be produced which will, it is hoped, enable further in-depth studies to be made into the whole life cycles and habitat requirements of these three groups. This should lead to more informed conservation management decisions which take into account the importance of both adult and juvenile phases of the life cycle.

At a recent meeting of people recording adult EPT, the national recorders stressed just how under-recorded these three groups are in their adult stages and that recording should be encouraged, especially by moth trappers. Light trapping for moths is widespread and popular in the UK and there is potentially a huge amount of data that could be gathered about EPT from willing moth trappers who are prepared to have a closer look at their by-catch and send on voucher specimens to their county recorder. The limitations of trying, successfully, to get a reliable species identification from photographs were also discussed. It was generally agreed that, although quite a few of the 199 British species of caddisflies could be reliably identified from good-quality photographs, many could not. Mayflies and stoneflies present similar problems.

If we are to address the apparent decline of some species, we need to have more accurate data with which to work; these include more information about species distributions and abundances as well as their life history strategies. Then we can better identify the possible causes of decline, whether this is due to habitat loss, pollution, invasive species or a combination of many causes. Moth trapping for river flies allows us to record adults of species which may be very difficult to record when in their juvenile stages: those, for example, from temporary habitats such as ponds and trickles which dry up and are not always easy to find. Some may even be of species not previously recorded and which, therefore, have never been investigated.

Light traps, where, when and which

Specimens can be attracted to the light sources used in both actinic and mercury vapour traps. Traps can be set pretty much wherever you like and usually between March and November. It is worth noting that some stoneflies appear very early on in the year, as early as February, even though it can be very cold and frosty. It is not known for all species whether or not they will come to light. You may, therefore, be surprised what turns up very early in the year. Some caddisflies appear early in the year (i.e. spring), disappear in summer and reappear in autumn: these species have what is known as a summer diapause. Flight periods are published for many species in their respective keys/guides and are useful in providing an indication of what you might see at different times of the year. Light trapping only works for the crepuscular and nocturnal flyers (as is true for the Lepidoptera) so diurnal species, e.g. the angler's Grannom *Brachycentrus subnubilus* may not come to the traps.

Tips on how to take voucher specimens from your by-catch for recording

When out with moth recorders, particularly when working multiple traps, we take a pooter, hand lens, some plastic bags and wear an apron or kangaroo pouch. We do not want to get in the way of the moth recording which can be quite a frantic affair and understand that it is important that all the moths get recorded and a voucher or two taken. Caddisflies, the group you are most likely to come across in your traps, are usually pootered up from the egg cartons. Small mayflies and stoneflies can also be dealt with in this way. It is often difficult to remove these by hand and the pooter can be quickly slipped in and out from the cartons when looking for moths. It is also useful to have a net ready for those which try to fly off. Some larger specimens can be hand caught and put into a collecting tube and popped into a plastic bag or apron pouch, and that way the catch from different traps can be kept separate. We can then look through the captures with a hand lens and identify some in the field. Those

we do not need to keep can be released and voucher specimens taken where necessary. We also try to take some photographs in the field even of specimens which will be kept for later identification under the microscope. Adult 'flies' can be euthanized by putting them in a collecting tube and then into the freezer for a couple of hours.

Many people who contribute specimens put them into envelopes which have their name, grid reference and date. These can then be stored until they can be handed over in person at a field or indoor meeting or put in the post, as a batch. In this way we were able to receive and identify almost 2000 adult caddisflies which had been caught during 2009 from the Rothamstead light trap at the Scottish Centre for Ecology and Natural Environment at Rowardennan on Loch Lomond. The data produced were used to compare with previous data on caddisflies from the site (Knowler, Flint & Flint, 2016). Some people prefer to keep the specimens in tubes of 70% alcohol with the data label written in pencil. It is vital that, if keeping specimens in alcohol, the label should not be written in an alcohol-soluble ink!

Records either go into iRecord or are sent directly to the National Recording Scheme coordinators. When putting records into iRecord we make sure we have clear photographs of genitalia and other characters that the verifier will need to confirm identification. The record includes a named location, a six figure grid reference, a date, the trap type and the name of the person who took the specimen together with any other habitat information available.

Using photographs for species identifications: size matters

Although some of the larger, more distinctive and common caddisflies such as *Limnephilus lunatus* (Plate 1, centre pages), can be reliably identified from good-quality photographs, others present more of a challenge. Micro-caddis of the family Hydroptilidae, for example, look very similar to each other and, due to their tiny size with wing lengths ranging from 1.5-5.0mm, can be difficult to spot in the moth trap. Voucher specimens are required as their genitalia must be examined to establish a specific identification. Some smaller representatives of the mayflies, such as the Baetidae, have to be identified using wing venation and genital characters. Stoneflies often wrap their wings over their bodies and characters used for their identification are hidden, so photographs of live specimens can often be of little help in identification, especially of the families Leuctridae and Nemouridae.

Resources to aid in identification

The Field Studies Council has produced fold-out guides to adult caddisflies (Barnard & Ross, 2008) and stoneflies (Price, Macadam & Brooks, 2007) and a ring-bound booklet (Macadam & Bennet, 2010) for the mayflies. These are useful for beginners to get an idea of these groups. For accurate identification of the caddisflies the most up to date key is Barnard and Ross (2012), for the mayflies, Elliott and Humpesch (1983) and for the stoneflies, Hynes (1977) should be consulted.

Acknowledgements

We would like to thank all those YNU members and others who continue to send us specimens for identification and the moth recorders who kindly allow us to collect specimens from their moth traps when we are out in the field. Special thanks to Dr Terry Whitaker, who provided the Craven Conservation Group actinic trap for us to use.

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If you are interested in contributing to the recording of any or all of these adult groups, you can contact Sharon Flint for help and advice via flintsentomologists@btinternet.com.

Field note: Mixed fortunes for broomrapes

Phyl Abbott

Earlier in the year I was told by Pauline Hogg of a plant which, in my opinion, was the most impressive find of the year. This was near Tadcaster (SE467417) in a field of Clover which hosted an amazing extent of the parasitic Common Broomrape *Orobanche minor*, which is by no means common in the north of England. However, on Leeds Naturalists' Club's visit to Hetchell Wood, we had the opposite experience in that our Yorkshire Broomrape *Orobanche reticulata* which, in Britain, grows only in Yorkshire, proved to be very elusive. We managed to find only two flowering spikes, though a Doncaster Naturalists' Society visit to the nearby East Keswick Nature Reserve found reasonable numbers of this species (P. Simmons pers. comm.).

A bilateral gynandromorph Orange-tip *Anthocharis cardamines*: Some observations

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A strikingly aberrant Orange-tip *Anthocharis cardamines* was photographed by Mark Coates at Askham Bog (VC64 Mid-west Yorkshire) on 13 June 2016 (see front cover). It shows a fine example of bilateral gynandromorphy where the insect is half male (in this case the left-side of the butterfly) and half female (right-side). This rare and intriguing sport of nature arises from the loss of one of the sex chromosomes from an initially typically developing homogametic[1] sex zygote. If the loss of one Z chromosome occurs at the first mitotic division (when the fertilised cell first divides into two) then the zygote will produce one cell with two same-sex (ZZ) chromosomes and one cell with a single Z sex chromosome. The possession of the two Z sex chromosomes in a cell steers development along the male path while the possession of only one Z sex chromosome steers development along the female path. In all subsequent cell divisions one half of the cells will code for male and the other half for female. The resulting adult is entirely male on one side and entirely female on the other side (see Plate 2, centre pages) – the adult butterfly is perfectly bisected sexually.

This makes for a particularly arresting visual effect for those species of butterflies that possess strong sexual dimorphism, such as the Orange-tip where only the male possesses the striking orange colouration on its upper forewings. In the example shown we can also see present in the right-hand side female forewing other, less immediately obvious, sexually dimorphic wing features beyond the absence of the orange patch: these are the larger discoidal spot and the larger black tip to the upper wing. In this particular example of bilateral gynandromorphy, the female forewing and hindwing are noticeably larger than those of the male's, something which mirrors the slightly larger size of female to male Orange-tips in general, although to my thinking, the size discrepancy evident here is more marked than is typically the case between normally developed male and female Orange-tips. Though we cannot see it, the rest of the butterfly's body such as the antennae, thorax and abdomen, are presumably also bisected along the mid-line. This would most noticeably affect those areas of the body that differ most between male and female, such as the genitalia.

A *bilateral* gynandromorph is a specific *type* of gynandromorphy. Most examples of gynandromorphy (which are rare occurrences in themselves) occur at later mitotic divisions, i.e. when the cell numbers in the developing egg are much higher than just one. A later mitotic division deletion will cause *mosaic* gynandromorphy where only some part of the butterfly is female and the majority of the butterfly is male. Such an example may have a patch of one of its wings lacking the orange colouring. A simple experiment in logical

[1] To confuse matters in butterflies the possession of the two same-sex chromosomes (ZZ) codes for male. In humans possession of the two same-sex chromosomes (XX) codes for female. Thus in butterflies the homogametic sex [from the Greek *homo*s and *gamos* meaning same and marriage respectively] is male while in humans it is female.

reasoning tells us that the chance of sex chromosome loss must be many orders higher at the first mitotic division than at subsequent cycles. If we assume a very small but constant chance of sex chromosome deletion *p* at any cell division (presumably very small because most Orange-tips we will ever see are either entirely male or female) then mosaic gynandromorphy would outnumber bilateral gynandromorphy by a factor of $p2^n$ where *n* is the number of mitotic cycles. The argument would be that if any cell division runs the same tiny risk of Z chromosome deletion then this risk multiplies with the number of cells dividing in the organism – thus risk must rise exponentially the further along the development of the organism has progressed. Given the number of cells in a fully developed egg (not to mention further stages in the development of the butterfly) is very large, this would mean that if the chance of sex chromosome deletion was constant then the number of bilateral gynandromorphs must either be vanishingly small (such that you would never see one) or that the number of mosaic gynandromorphs would be astonishingly high. Neither situation is the case – bilateral gynandromorphs are rare but you do find them – and, though not as rare, we are not inundated with mosaic gynandromorphs either. We must conclude then that the chance of sex chromosome deletion is higher at the first mitotic cycle compared to later cycles.

People seem to take less interest in aberrations in general nowadays than they used to, e.g. in the Victorian era (for some fascinating accounts see Salmon, 2000). Why this should be the case might be something to do with the rise of awareness of macro- and micro-moths (especially now with the ready availability of good moth field guides). Previously, the budding butterfly enthusiast might notch up sightings of all known British butterflies within a few years. For further challenge, they would start looking for the known butterfly aberrations and maybe even hope to discover a new one. Nowadays, the butterfly enthusiast is more likely to move on to the study of the moth groups. Perhaps also we should blame the mediocre weather with its poor summers. There are many aberrations arising from environmental effects – for instance, extremes of weather such as unseasonably high temperatures when pupae are developing can cause different expression of genes. The fine summer of 1976 was responsible for a large number of aberrations, such as the greater expression of the black markings (melanism) in fritillaries and especially Silver-washed Fritillary *Argynnis paphia* (Russwurm, 1978). It might be simplistic to suggest but might we expect an increase in aberrations showing lower expression of black marking (albinism) when we have colder temperatures during pupal development? Though I'm possibly cherry-picking my memories this does seem to be the case.

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Freshwater plants and SSSI canals in the East Midlands and North of England 1: Leeds & Liverpool Canal and Huddersfield Narrow Canal

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Canals and their towing paths in England have multiple uses; as well as navigation they are used by walkers, runners, cyclists and anglers. Some are important for drainage, water supply or disposal of treated effluent. Some canals pass through deeply rural environs while other canal-side locations host traditional industry or new commercial or retail estates; some are the focus of leisure activity and housing development. Biological conservation is also an important aspect of the canal scene. Many canals, both rural and urban, have abundant and diverse aquatic plant communities and many lengths of canal are Sites of Special Scientific Interest (SSSI); Briggs (2012) reported that around 9% (c. 225km) of the then British Waterways' canals had been notified as SSSI.

Sites of biological conservation value are chosen for notification as SSSIs by Natural England or were chosen by its predecessors, English Nature or the Nature Conservancy Council; guidelines for selection of freshwater sites are published by the Joint Nature Conservation Committee (JNCC, 2016). The point is made that artificiality does not preclude special wildlife interest, hence canals are within the remit for selection. JNCC groups canals with standing freshwaters, although it is realized that they may overlap with river habitats. Outstanding aquatic plants and vegetation are often the principal reason for notification; attention is given to both submerged/floating-leaved communities and to emergent marginal communities. Criteria for site selection include: high species richness; the presence of a number of different plant communities; uncommon or rare species; widespread plant cover; unusual site types. Special emphasis is placed on pondweeds (*Potamogeton*); a high number of pondweeds is considered to indicate high conservation value; eight or more would indicate an exceptional site.

Interactions between canal management, navigation and wildlife have been reviewed in the comprehensive report published by the Inland Waterways Advisory Council (IWAC, 2008). That report takes a largely positive view of the state of wildlife in canals; it demonstrates how management can be both beneficial and deleterious to wildlife and emphasizes a potential synergy between active management and wildlife conservation. Case studies of specific waterways are used to illustrate the theme of successful coexistence between navigation and wildlife conservation; for example the Rochdale Canal wherein restoration to navigation (completed 2002) and subsequent modest boat traffic are understood to have facilitated a moderate level of disturbance that favours a valuable plant community, including Floating Water-plantain, which has Europe-wide protection, and nine pondweeds, at the expense of encroaching, more vigorous, aquatic plants.

Less sanguine is Briggs (2012) in his review of the state of canal wildlife at around the time of the transfer of canals in England and Wales from British Waterways (BW) into the stewardship of the Canal & River Trust. He identified much that was positive for wildlife during BW's tenure, including a trend towards softer approaches to bank stabilization than sheet steel, and increased planning for wildlife in engineering projects. Nevertheless, he drew unflattering attention to the state of canal SSSIs nationally; specifically he drew attention to Natural England's status assessment of SSSIs along 18 canals. Of these only six of twenty-five canal SSSIs had been assessed, even in part, as being in a favourable condition.

This and subsequent articles address aquatic plants and vegetation along seven canal SSSIs in the East Midlands and North of England. They were notified as SSSI between 1962 and 1988; the relevant length of canal ranged from the 5.1km of the Leven Canal to 19.4km of the Chesterfield Canal (Table 1). The reasons for notification are summarized by Natural England (2016) in brief descriptions that comprise SSSI site citations. Aquatic plants were important at all these sites at the time of their notification. The descriptions of flora in the site citations clearly reflected the criteria for selection of SSSIs laid down by JNCC (2016). All sites were selected for high species richness of aquatic plants; some had nationally scarce or significant plants, e.g. Water-violet, Floating Water-plantain and Hairlike Pondweed in the Huddersfield Narrow Canal, Lesser Water-plantain *Baldellia ranunculoides* and Soft Hornwort *Ceratophyllum submersum* in the Pocklington Canal; some had many species of pondweeds, e.g. eight in the Leeds & Liverpool Canal and at least six in the Huddersfield Narrow Canal; some were unusual sites, e.g. the seemingly brackish community of the Chesterfield Canal, with Brackish Water-crowfoot *Ranunculus baudotii* seen as a brackish-water indicator, and the Leven Canal with its possibly relict community from the lost calcareous marshes and meres of East Yorkshire.

Table 1. Canal SSSIs and Natural England's assessment of their status*

SSSI (and date of notification)	**Approx. length of SSSI canal**	**Date of assessment by Natural England¶**	**Status**
Chesterfield Canal (1987)	19.4km	January 2010	100% unfavourable - no change
Cromford Canal (1981)	8.1km	January 2010	100% unfavourable - recovering
Grantham Canal (1981)	6.5km	March 2014	100% unfavourable - no change
Huddersfield Narrow Canal (1988)	9.3km	November 2010	100% unfavourable - no change
Leeds & Liverpool Canal, inc. Armley Basin (1984)	8.4km(+Armley Basin 0.3km)	November 2011-April 2012	80% unfavourable - recovering; 20% favourable
Leven Canal (1962)	5.1km	September-December 2013	92% unfavourable – recovering; 8% unfavourable-no change
Pocklington Canal (1987)	6.8km	October 2010	100% unfavourable - declining

*Information from Natural England (2016); ¶These assessments may be based on significantly earlier surveys.

Natural England's assessments of the status of these seven canal SSSIs are depressing (Table 1). Almost all are regarded as being in unfavourable condition. Some are believed to be in a stable unfavourable state (Chesterfield Canal, Grantham Canal, Huddersfield Narrow Canal); in others recovery is possibly underway (Cromford Canal, Leeds & Liverpool Canal, Leven Canal) while the condition of the Pocklington Canal is said to be declining. Amongst all the sites, only 20% of the Leeds & Liverpool Canal SSSI is regarded as in favourable condition

The aims of this study were to record aquatic plants and their abundance, to assess current botanical conservation importance, and to identify changes since the sites were notified as SSSIs. This first article addresses SSSIs on the Leeds & Liverpool Canal and Huddersfield Narrow Canal. Two subsequent articles will consider the Chesterfield, Cromford, Grantham, Leven and Pocklington canals and a fourth article will provide an overview. Nomenclature of plants follows Stace (2010); scientific names are given in the text only if they do not occur in the tables.

The canal SSSIs

Leeds & Liverpool Canal

The Leeds & Liverpool Canal SSSI extends for c. 8.4km from Calverley Lodge Swing Bridge (SE213374) approximately eastwards towards Leeds city centre as far as Armley Mill rail bridge (SE273342). The canal here is a vice-county boundary with VC64 Mid-west Yorkshire to the north and VC63 South-west Yorkshire to the south. In addition Armley Basin (SE270342) is included within the SSSI. This basin is about 300m long by 15m wide and lies parallel to the north side of the main line of the canal; it was excavated in the 1920s for use by boats that delivered coal to Kirkstall Power station until the 1960s (Anon., 2016). The power station was converted to oil-burning, closed in the late 1970s and demolished; the basin is currently in use as a marina. The canal is broad gauge and there are two staircases of three locks and one single lock along the SSSI. The environs of the SSSI are initially rural but as Leeds is approached the canal passes through the extensively wooded, in places post-industrial, Kirkstall Valley Park. Hard sides preclude extensive emergent vegetation but submerged vegetation can be conspicuous in places without tree shading. Commercial traffic on the canal has been superseded by a moderate degree of leisure boating; Spring Garden Lock, c. 1.3km beyond the SSSI towards Leeds centre, was operated 996 times in 2015 (CRT, 2016) while 17 boat movements were observed over 3 days recording along the SSSI during June-July 2015.

Huddersfield Narrow Canal

The Huddersfield Narrow Canal SSSI (in VC58 Cheshire and VC59 South Lancashire) lies west of the canal's Pennine summit and extends for c. 9.3km from Roaches Bridge (SD981033), about 1.5km north of Mossley, westwards (geographically approximately south-west), passing through the centre of Stalybridge, to Footbridge 29 (SJ935985) in Ashton-under-Lyne. The most westerly c. 0.9km of the SSSI is part of the Ashton Canal which makes an end-on junction with the Huddersfield Narrow Canal. The environs are a complex matrix of rural, semi-rural, urban, commercial, industrial and post-industrial landscape; there are 15 locks along the SSSI. Trade over the summit of the canal ceased in the early twentieth century and the canal was closed throughout by 1944 (Russell, 1983). The locks were capped or cascaded

and the canal became derelict although a flow of water was maintained through the SSSI section to provide a water supply for industry and the Ashton Canal. OS maps from the 1980s (Edina Digimap, 2016) show c. 1.0km of canal culverted through the centre of Stalybridge and another c. 0.4km at about 1.2km north-east of Stalybridge. Restoration of the Huddersfield Narrow Canal to leisure navigation was undertaken through the 1980s and 1990s and the canal was reopened in its entirety in 2001 (Gibson, 2002). The restoration entailed extensive rebuilding throughout of lock chambers and wash walls and the opening-up and rebuilding of culverted sections as open channel with hard vertical margins. Neither emergent nor submerged vegetation is generally conspicuous. Boat traffic is moderate; Whitehead's Lock (Lock 12W), which is within the SSSI was operated 430 times in 2015 (CRT, 2016) while only two boat movements were observed during two days recording in August 2015.

Recent plant records and change since SSSI notification

For survey in 2015 the SSSIs were divided into discrete lengths (Table 2). These were delineated by topographical features, usually bridges or locks, and ranged from 0.3-1.2km (mean 0.9km) in the Leeds & Liverpool Canal and 0.8-1.4km (mean1.0km) in the Huddersfield Narrow Canal.

Table 2. Lengths of the Leeds & Liverpool and Huddersfield Narrow Canal SSSIs surveyed.

Canal	Lengths surveyed*
Leeds & Liverpool Canal	1. Calverley Lodge Swing Bridge to Owl Swing Bridge (c. 0.9km) 2. Owl Swing Bridge to Moss Swing Bridge (c. 1.2km) 3. Moss Swing Bridge to Ross Mill Swing Bridge (c. 1.0km) 4. Ross Mill Swing Bridge to Newlay 3 Locks (c. 1.1km) 5. Newlay 3 Locks to Forge 3 Locks (c. 0.9km) 6. Forge 3 Locks to Kirkstall Lock (c. 0.8km) 7. Kirkstall Lock to Wyther Bridge (c. 0.8km) 8. Wyther Bridge to Redcote Bridge (c. 1.1km) 9. Redcote Bridge to Rail Viaduct 224A (c. 0.6km) 10. Armley Basin (c. 0.3km)
Huddersfield Narrow Canal	1. A635 Roaches Bridge to Lock 14W (c. 1.0km). 2. Lock 14W to Egmont Street Bridge (92) (c. 0.8km). 3. Egmont Street Bridge to Scout Tunnel East Portal (c. 0.8km). 4. Scout Tunnel West Portal to Grove Road Bridge (c. 1.2km). 5. Grove Road Bridge to Knowl Bridge (c. 1.4km). 6. Knowl Bridge to Lock 4W (c. 0.9km). 7. Lock 4W to Clarence Street Bridge (c. 1.0km). 8. Clarence Street Bridge to Lock 1W (c. 1.0km). 9. Ashton Canal, Lock 1W to Footbridge 29 (c. 0.9km).

*Names of locations are from Anon. (2009).

Only plants on the JNCC (2005) *Common Standards Monitoring Guidance for Canals* checklists for native aquatic plants and non-native aquatic vascular plants were routinely recorded. Recording was by eye and submerged plants were retrieved for identification using a walking

pole, extensible to 1.5m, with a hook on its end. In addition 60 grapnel hauls were made in Armley Basin. Recording was mostly from the towing path and emergent plants on the far side were identified using binoculars. The abundance of each plant in each length was recorded using the subjective DAFOR approach (Kent, 2012) but employing a truncated 3-point scale; i.e. dominant or abundant (d/a), frequent (f) and occasional or rare (o/r). To obtain an approximate integrated measure that represented both species richness and abundance in each length, the DAFOR scores were converted to numerical abundance scores (i.e. d/a=3, f=2, o/r=1) and the sum of these abundance scores ($\sum AS$) was calculated. Recording was during June-August 2015 except that plants in Armley Basin were recorded in June 2013. Plants were recorded along the entire length of the SSSIs.

Description of changes in the flora of canal SSSIs since their notification is not necessarily straightforward. Site citations for canal SSSIs (Natural England, 2016) generally give brief descriptions of plant communities and mention characteristic and scarce or rare plants recorded at around the time of notification. Usually a full list of the plants present at notification is not given, indeed even important ones may not be specifically mentioned; for example the citation for the Leeds & Liverpool Canal SSSI claims eight pondweeds but only the scarce Hairlike Pondweed is specifically named. Comprehensive plant surveys were, however, carried out at or around the time of notification and there have been subsequent surveys. These have usually been undertaken by in-house scientists or by ecological consultants on behalf of the responsible statutory organisations: e.g. Nature Conservancy Council; English Nature; Natural England; British Waterways. These surveys have generated reports that are part of the "grey literature". They are not necessarily known to or easily available to a wider audience. In this study I have used resources that have been generously made available by Natural England and the Canal & River Trust, but it is likely that other relevant material has been missed.

Leeds & Liverpool Canal

Fifteen submerged and floating-leaved plants were recorded in the Leeds & Liverpool Canal SSSI (Table 3) and they tended to be most noticeable in stretches that were not deeply shaded by trees. Twenty emergent plants were recorded (Table 3) and, as well as by shading, these tended to be limited by sheer sides of concrete or sheet steel and deep water; exceptions were where siltation along the edges made for shallower water and places where there was a soft margin on the far side from the towing path which included occasional cattle-poached canal-side pasture. The complete data set is available as additional electronic material (Appendix 1.1, accessible at: http://www.ynu.org.uk/downloads/naturalist).

The mean number of submerged and floating-leaved species per length was 9.5 (range 7-13) while mean $\sum AS$ = 15.6 (11-21) (Table 4).

Arrowhead was by far the most abundant submerged/floating-leaved plant along the main line of the canal (Lengths 1-9) being dominant or abundant in all but two lengths (Table 3). In all but the deepest shade it tended to be found as continuous beds of underwater ribbon-like leaves along both sides of the central channel and sometimes occupied virtually 100% of the

channel. Its characteristic emergent arrow-shaped leaves and flowers were less frequently encountered. Other important submerged plants, recorded in all lengths, were Fennel Pondweed, dominant/abundant in the four most westerly lengths and Nuttall's Waterweed which was dominant/abundant in all but three lengths. In all, five species of pondweed (*Potamogeton)* were found in the main line of the canal and in addition Hairlike Pondweed was found in Armley Basin. Of these, Perfoliate Pondweed was recorded in all but one of Lengths 1-9, being frequent in three of these; Lesser Pondweed was found in seven of Lengths 1-9 being frequent in Lengths 1-3; Curled Pondweed and Broad-leaved Pondweed were each recorded in only one of Lengths 1-9. The floating leaves of Unbranched Bur-reed, trailing along the water surface, were observed in all but one length and this plant was recorded as frequent in the three most easterly lengths (Lengths 7-9). Greater Water-moss was often found attached to piling at the canal margin; it was recorded as frequent in three of Lengths 1-9. An unexpected find was a single floating frond of Greater Duckweed at Ross Hall Swing Bridge (Length 4).

The mean number of emergent species per length was 9.8 (range 5-16) and $\sum AS$ = 12.9 (5-22) (Table 4). Although the prevalence of relatively deep water, sheer sides and widespread shade worked against the success of emergent marginal vegetation, Reed Sweet-grass was present in all nine main-line canal lengths and was dominant or abundant in seven of these (Table 3). The only other emergent plants that were ever recorded as dominant or abundant were Flowering-rush which was found in all lengths and was dominant/abundant in Length 6, and Bulrush which had an intermittent distribution, being dominant/abundant in Lengths 6 & 8 but recorded in only two other lengths. Other emergent plants found in the majority of lengths 1-9, but never dominant or abundant, were: Sweet-flag; Creeping Bent; Yellow Iris; Water Mint; Water Forget-me-not; Water-cress; Hemlock Water-dropwort; Reed Canary-grass (Table 3).

A habitat that favours diversity of emergent plants along canals is cattle-poached unshaded pasture bordering the margin on the opposite side to the towing path. Thus the length along which the greatest number of emergent plants was recorded (Length 1) had such pasture on its south side. This was accessible over about 70m of canal immediately west of Owl Swing Bridge; in this poached margin were recorded Sweet-flag, Creeping Bent, Lesser Water-parsnip, Flowering-rush, Reed Sweet-grass, Water Mint, Water Forget-me-not, Water-cress, Hemlock Water-dropwort, Celery-leaved Buttercup, Branched Bur-reed, and Brooklime along with emergent Arrowhead and non-JNCC-checklist plants Great Willowherb *Epilobium hirsutum*, Meadowsweet *Filipendula ulmaria* and Gypsywort *Lycopus europaeus.*

Another good example of colonization by emergent plants was a stand of marginal vegetation, c.30m x 3-5m that had established immediately east of Kirkstall Lock on the far side from the towing-path (Length 7). This stand included Sweet-flag, Lesser Water-parsnip, Flowering-rush, Water Mint, Water Forget-me-not, Hemlock Water-dropwort, the emergent form of Amphibious Bistort and Reed Canary-grass; also present were the non-checklist wetland plants Indian Balsam *Impatiens glandulifera*, Jointed Rush *Juncus articulatus*, Toad Rush *Juncus bufonius* and Marsh Woundwort *Stachys palustris*.

Armley Basin had deep water and sheer margins; it was in use as a marina for mooring of leisure boats but its south side was kept free of moored boats. Submerged plants were a notable feature of the basin in June 2013; these were readily visible, moreover submerged plants, often with masses of blanket weed (the filamentous alga *Cladophora*) were retrieved in virtually all grapnel hauls. The most abundant plant was Nuttall's Waterweed and an extensive underwater carpet of this was to be seen along most of the south side of the basin; submerged Arrowhead was also dominant/abundant. Six pondweeds were found in the basin; Perfoliate Pondweed and Broad-leaved Pondweed were recorded as frequent while Curled Pondweed, Fennel Pondweed, Lesser Pondweed and Hairlike Pondweed were occasional or rare. Flowering-rush was frequent, but with submerged rather than emergent leaves; also frequent were Greater Water-moss, attached to the sheer sides, and Ivy-leaved Duckweed, mostly entangled amongst Nuttall's Waterweed and blanket weed. Emergent plants were essentially absent apart from a single small stand of Reed Sweet-grass along the south side and occasional individuals of Water Mint and Brooklime in the gap between moored boats and the side of the basin, and a lone plant of Hemlock Water-dropwort rooted in a rope fender. In all, 19 JNCC checklist plants were found in the basin.

Some of the plants found (Table 3) feature on the provisional *Vascular Plant Red Data List for VC63* (Wilmore, 2013); Hairlike Pondweed is regarded as very rare in VC63 South-west Yorkshire and Greater Duckweed as scarce. In addition Lesser Pondweed has been regarded as scarce in VC64 Mid-west Yorkshire (Abbott, 2005).

The 1984 citation for the Leeds & Liverpool Canal SSSI (Natural England, 2016) claimed the canal, with its clear water and rich aquatic flora, as the best example of a slow-flowing aquatic habitat in the county. The submerged/floating-leaved flora included eight pondweeds, although only Hairlike Pondweed was named, and also Rigid Hornwort and abundant Arrowhead. There was noteworthy emergent vegetation that included the locally uncommon Flowering-rush and Sweet-flag. In addition several contemporary and later distribution maps and survey reports have been made available by Natural England and CRT. These include: descriptions of the vegetation and plant lists made for the Nature Conservancy Council around 1981-1982 (Knights, 1981, 1982; Anon., 1981); maps from NCC showing the distribution of plants in the SSSI dated 1990 with an appendix that includes plant lists for 1983 and 1990 (Anon., 1990); a brief description of vegetation along the SSSI in 1990 (Bignall, 1990) which may relate to the distribution maps mentioned above (Anon., 1990); a 1995 report on plants and their distribution in Armley Basin by Ecological Advisory Service, Keighley (Anon. 1995); a survey of plants in the SSSI in September 1998 (Anon., 1998); a 2001 plant survey of Armley Basin by Bullen Consultants for English Nature (Anon., 2001). There was also a comprehensive survey of plants in the SSSI in 2012 by Ecus Environmental Consultants (Anon., 2013).

Around the time of SSSI notification in 1984 the canal evidently had a rich and diverse flora of submerged/floating-leaved plants. There were at least 17 submerged/floating-leaved plants. The eight pondweeds were Small Pondweed, Curled Pondweed, Broad-leaved Pondweed, Fennel Pondweed, Perfoliate Pondweed, Lesser Pondweed, Blunt-leaved Pondweed and

Hairlike Pondweed. Also amongst the principal plants were water-starwort, Rigid Hornwort, Canadian Waterweed, Nuttall's Waterweed, Common Duckweed, Ivy-leaved Duckweed, Spiked Water-milfoil, Arrowhead and Unbranched Bur-reed (Anon., 1981). Surveying in 1990 demonstrated the persistence of a diverse submerged and floating-leaved flora with Canadian Waterweed, Arrowhead and Unbranched Bur-reed being most abundant (Bignall, 1990). Some submerged plants recorded in 1983 were, however, not found in 1990; these included Bulbous Rush, Spiked Water-milfoil, Small Pondweed, Curled Pondweed, Blunt-leaved Pondweed, Lesser Pondweed and Hairlike Pondweed (Anon., 1990).

It is encouraging that in 2015 there was still a species-rich submerged/floating-leaved flora (Table 3). Moreover, many plants recorded in the 1980s (Nuttall's Waterweed, Fennel Pondweed, Arrowhead) were dominant or abundant in much of the SSSI while others were in places frequent (Ivy-leaved Duckweed, Broad-leaved Pondweed, Perfoliate Pondweed, Lesser Pondweed and Unbranched Bur-reed). Six of the eight pondweeds reported in the 1980s were re-found, albeit Hairlike Pondweed was sparse and only in Armley Basin. The apparently lost pondweeds were Small Pondweed and Blunt-leaved Pondweed. In all, eight submerged/floating leaved plants that have previously been found in the SSSI were not recorded in 2013 or 2015 (Table 5). The most striking apparent losses were Rigid Hornwort, Canadian Waterweed and Spiked Water-milfoil which were formerly amongst the principal species in the canal.

Although the 1984 SSSI citation emphasized submerged plants the canal was said also to support a characteristic range of emergent plants (Natural England, 2016); amongst these, however, only Sweet-flag and Flowering-rush were named. Nevertheless, many others were there; other emergent plants recorded in 1983 included Creeping Bent, Water-plantain, Lesser Water-parsnip, Greater Pond-sedge, Water Horsetail, Floating Sweet-grass, Reed Sweet-grass, Yellow Iris, Soft-rush, Water Mint, Water forget-me-not, Water-cress, Hemlock Water-dropwort, Reed Canary-grass, Bittersweet and Brooklime (Anon., 1990). Seven years later in 1990 the persistence of considerable stands of emergent and marginal vegetation was reported; most abundant were emergent plants of Arrowhead and Unbranched Bur-reed while Flowering-rush and Reed Sweet-grass were conspicuous (Bignall, 1990). Emergent plants apparently new in 1990 were Fool's-water-cress and Bulrush (Anon., 1990).

The 2015 survey demonstrated that most of these emergent plants were still to be found; (Table 3). Reed Sweet-grass was often dominant or abundant while Flowering-rush remained as an important component of the emergent flora and Sweet-flag continued to be widespread. Emergent leaves of Arrowhead also continued to be a notable feature. Although hard sheer sides and deep water in many places rendered the canal margin an unsuitable habitat for emergent plants, the high species richness in 2015 reflected the continued existence of sites where there were softer margins, sometimes cattle-poached, and areas where silt had accumulated. There were six emergent plants that were recorded before 2001 but not in 2015 (Table 5) but none of these seem to have previously been a conspicuous component of the emergent flora.

The 14 plants that have apparently been lost from the Leeds & Liverpool Canal SSSI (Table 5) are generally not rare or scarce in VC63 South-west Yorkshire or VC64 Mid-west Yorkshire (Abbott, 2005; Wilmore, 2013); the exception being Blunt-leaved Pondweed which is rare in both vice-counties.

Huddersfield Narrow Canal

Only five submerged or floating-leaved plants and also 18 emergent plants were recorded in the Huddersfield Narrow Canal SSSI in 2015 (Table 3). The full set of data is available as additional electronic material.
(Appendix 1.2, accessible at:: http://www.ynu.org.uk/downloads/naturalist).
The canal was notable for its relatively sparse aquatic plants; only Bulrush was ever recorded as dominant/abundant and then only in one of the nine lengths surveyed (Length 1). Much of the canal was intermittently tree-shaded and had sheer masonry wash walls with relatively sparse marginal vegetation and peaty, brownish and somewhat turbid, deep open water with virtually no submerged or floating-leaved plants. The mean number of species of submerged and floating-leaved plants per canal length was a very low, 0.6 (range 0-2), while the mean $\sum AS$ was also 0.6 (range 0-2) (Table 4). For emergent plants the mean number of species per canal length was 6.1 (1-13) and the mean $\sum AS$ was 8.1 (1-18).

The only notable stand of submerged or floating-leaved plants was of Curled Pondweed in Length 8 where it had colonized a short arm immediately east of Lock 1W on the north side of the canal, and in which there was also a floating patch of Common Duckweed c. 3m x 2m. A feature of the canal in Lengths 4 & 5 was an intermittent enclosure formed by wooden posts and boards, c. 2m wide, parallel to the north side of the canal. This has partly been dismantled or its construction may not have been completed; it is intended as a refuge for plant conservation but as it was on the far side from the towing path it was largely inaccessible. Where there was access in Length 4 a few sparse and scattered submerged plants of Small Pondweed and stonewort were found in the enclosure. A project to re-introduce Floating Water-plantain to the SSSI was underway in summer 2015 (Anon., 2015) but none of these plants were seen.

Emergent aquatic plants were most plentiful in Length 1, Roaches Bridge to Lock 14W; here on the south of the canal is an area of woodland known as The Roaches that is a local nature reserve. This woodland slopes down to the canal side and merges with the marshy margin of the canal; here there was a wide range of emergent aquatic plants and wetland plants. JNCC checklist species were Sweet-flag, Creeping Bent, Marsh-marigold, Water Horsetail, Yellow Iris, Soft-rush, Water Mint, Water Forget-me-not, Reed Canary-grass, Branched Bur-reed, Bulrush and Brooklime. Associated wetland plants, along with willow saplings, included Remote Sedge *Carex remota*, Great Willowherb, Meadowsweet, Indian Balsam, Gypsywort, Wood Club-rush *Scirpus sylvaticus*, Skullcap *Scutellaria galericulata* and Marsh Woundwort.

There were intermittent marginal stands of Bulrush along Lengths 2-5, about 4.2km of canal, where this plant was recorded as frequent. Also sometimes recorded as frequent in these four lengths were Sweet-flag, Yellow Iris, Soft-rush, Reed Canary-grass and Branched Bur-reed. Here too, and of conservation interest, but never more than occasional/rare, were

Flowering-rush and Lesser Bulrush. Also interesting were occasional plants of Water Dock rooted in the wash wall in Lengths 1 & 2. The timber enclosures that were in places along the north side of the canal in Length 4, and especially in Length 5, were largely inaccessible and colonizing plants were, therefore, mostly identified from the towing path using binoculars. These included Sweet-flag, Flowering-rush, Yellow Iris, Soft-rush, Water Mint and Bulrush. There was also a large tussocky sedge that remained unidentified.

Very few emergent plants were present along Lengths 6-9, about 3.8km of canal; only six species were recorded and, except for Yellow Iris being frequent in Length 6, none were ever recorded as more than occasional or rare. Much of Length 6 consists of deep water within a post-restoration hard-sided channel that strives to be a public-amenity feature in its urban and commercial environs as it passes through the centre of Stalybridge. Here boxes have been installed at around water level at bridges on both sides of the canal and planted with emergent aquatic plants. These planters held species that are present elsewhere in the canal plus a mix of contaminant and invasive plants. JNCC checklist plants were Creeping Bent, Flowering-rush, Yellow Iris and Water Mint. Non-checklist plants included Wild Angelica *Angelica sylvestris*, Butterfly-bush *Buddleja davidii*, Hedge Bindweed *Calystegia sepium*, Great Willowherb, Meadowsweet, Gypsywort, Purple-loosestrife *Lythrum salicaria*, Common Ragwort *Senecio jacobaea*, Water Figwort *Scrophularia auriculata* and Skullcap.

None of the aquatic plants recorded (Table 3) were rare or scarce in VC58 Cheshire (Kay, 2015). Nor were they uncommon in VC59 South Lancashire where all occurred post 1987 in 10 or more of forty-three 10km x 10km squares; least common are Flowering-rush in 10 squares, Lesser Bulrush in 12 and Water Dock in 13 (Preston, Pearman & Dines, 2002).

The Huddersfield Narrow Canal was an important site for aquatic-plant conservation during the latter part of the twentieth century. This is emphasized by contemporary accounts of the rich submerged and emergent flora in the canal east of its Standedge Tunnel summit (Morphy, Thomas & Higgins, 1980; Morphy, 1981). In respect of the western part of the canal, the 1988 SSSI citation (Natural England, 2016) is comprehensive in its description and listing of the abundant and important aquatic plants that were to be found. Furthermore a review of ecology and nature conservation issues in the canal was commissioned by British Waterways from Penny Anderson Associates (Anon., 1996). This review considered the results of surveys of the vegetation of the SSSI that had earlier been undertaken by the Greater Manchester Countryside Unit (GMCU) in 1984 and by English Nature in 1991. The results of these two surveys were also compared and contrasted by Hill (1991). In addition a detailed survey of plants and other wildlife along the whole of the Narrow Canal was undertaken in 1997 and 1998 for British Waterways by WWT Wetlands Advisory Service, Slimbridge (Pedlow *et al.*, 1998).

The 1988 SSSI citation described the canal as an example of a eutrophic flowing-water system; the main habitats were standing and running water, swamp and fen. Submerged and floating-leaved plants were diverse and prolific and included a wide range of pondweeds; Small Pondweed, Grass-wrack Pondweed, Fennel Pondweed, Perfoliate Pondweed, Long-stalked Pondweed and Hairlike Pondweed were named. There were extensive beds of

Common Water-starwort *Callitriche stagnalis*, Canadian Waterweed, Nuttall's Waterweed and Spiked Water-milfoil while Water Fern, Autumnal Water-starwort, Water-violet, Floating Water-plantain and Unbranched Bur-reed were locally abundant. One or both of the surveys of 1991 and 1997-1998 (Hill, 1991; Pedlow *et al*., 1998) added Rigid Hornwort, Fat Duckweed, Common Duckweed, White Water-lily, Broad-leaved Pondweed, Greater Duckweed and possibly Shining Pondweed to the list of submerged and floating leaved plants that were to be found.

The sparse submerged and floating-leaved vegetation of the SSSI in 2015 (Table 3) was a great contrast to that at the time of its 1988 notification. Only five plants were recorded in 2015 over 9.3km of canal and not one was ever recorded as more than occasional or rare. Only two pondweeds were found, Curled Pondweed and Small Pondweed. About 20 submerged/floating-leaved plants appear to have been lost since notification (Table 5). The pronounced loss of pondweeds appears to have been underway by the time of the 1997 and 1998 surveys since by then only Broad-leaved Pondweed and Perfoliate Pondweed were recorded; nor, for example, were Water Fern, Water-violet, Fat Duckweed or Spiked Water-milfoil found in that survey (Pedlow *et al*., 1998).

The 1988 SSSI citation (Natural England, 2016) described the canal vegetation as including swamp and tall fen as well as marginal vegetation, which suggests that in places the whole channel had come to be occupied by emergent plants. There were stands dominated by Flowering-rush, Reed Sweet-grass, Water-cress, Arrowhead, Branched Bur-reed or Bulrush. Mixed communities of these plants also occurred, sometimes with Sweet-flag, Water-plantain, Common Spike-rush, Yellow Iris, Soft-rush and Water Forget-me-not, along with non-JNCC checklist species that included Remote Sedge, Great Willowherb and Jointed Rush. Additional JNCC checklist emergent plants recorded in the 1991 (Hill, 1991) and/or 1997-1998 (Pedlow et al., 1998) surveys included Creeping Bent, Marsh-marigold, Greater Tussock-sedge, Water Horsetail, Marsh Horsetail, Floating Sweet-grass, Water Mint, Amphibious Bistort, Reed Canary-grass, Water Dock, Bittersweet, Blue Water-speedwell and Brooklime.

In contrast, emergent plants were much less important in 2015 (Table 3). They had decreased to the extent that only one emergent plant was ever recorded as dominant or abundant (Bulrush in Length 1) and much of the canal was virtually devoid of emergent vegetation. Nevertheless, intermittent marginal vegetation was established in places although ten of the emergent plants recorded by the SSSI citation and/or by the 1984, 1991 or 1997-1998 surveys were not re-recorded in 2015 (Table 5).

It is of concern that several of the plants that have apparently been lost (Table 5) were noted as nationally or locally rare or scarce in the 1988 SSSI citation. These included Autumnal Water-starwort, Floating Water-plantain, Grass-wrack Pondweed, Long-stalked Pondweed, Hairlike Pondweed and Water-violet. These plants in general continue to be locally rare or scarce or are no longer found in VCs 58 Cheshire and 59 South Lancashire (Preston, Pearman & Dines, 2002; Kay, 2015).

Table 3. Aquatic plants recorded and the number of canal lengths in which they were found; Leeds & Liverpool Canal and Huddersfield Narrow Canal SSSIs, June-August 2015.

	Leeds & Liverpool	**Huddersfield Narrow**
Number of canal lengths surveyed	10*	9
Submerged and floating-leaved plants		
Callitriche sp. water-starwort	1	1
Chara/Nitella stonewort	0	1
Elodea nuttallii Nuttall's Waterweed	10(7)	0
Fontinalis antipyretica Greater Water-moss	9	0
Lemna minor Common Duckweed	10	1
Lemna trisulca Ivy-leaved Duckweed	10	0
Potamogeton berchtoldii Small Pondweed	0	1
Potamogeton crispus Curled Pondweed	2	1
Potamogeton natans Broad-leaved Pondweed	2	0
Potamogeton pectinatus Fennel Pondweed	10(4)	0
Potamogeton perfoliatus Perfoliate Pondweed	9	0
Potamogeton pusillus Lesser Pondweed	8	0
Potamogeton trichoides Hairlike Pondweed	1	0
Sagittaria sagittifolia Arrowhead	10(8)	0
Sparganium emersum Unbranched Bur-reed	9	0
Spirodela polyrhiza Greater Duckweed	1	0
Zannichellia palustris Horned Pondweed	3	0
Emergent plants		
Acorus calamus Sweet-flag	5	3
Agrostis stolonifera Creeping Bent	10	9
Alisma plantago-aquatica Water-plantain	1	0
Berula erecta Lesser Water-parsnip	2	0
Butomus umbellatus Flowering-rush	10(1)	3
Caltha palustris Marsh-marigold	0	1
Equisetum fluviatile Water Horsetail	0	1
Glyceria fluitans agg. Floating Sweet-grass	1	0
Glyceria maxima Reed Sweet-grass	10(7)	1
Iris pseudacorus Yellow Iris	5	7
Juncus effusus Soft-rush	2	6
Mentha aquatica Water Mint	10	3
Myosotis scorpioides Water Forget-me-not	6	2
Nasturtium officinale Water-cress	5	0
Oenanthe crocata Hemlock Water-dropwort	9	0
Persicaria amphibia Amphibious Bistort	1	1
Phalaris arundinacea Reed Canary-grass	6	5
Ranunculus flammula Lesser Spearwort	0	1
Ranunculus sceleratus Celery-leaved Buttercup	2	0
Rumex hydrolapathum Water Dock	0	2
Solanum dulcamara Bittersweet	3	0
Sparganium erectum Branched Bur-reed	3	3
Typha angustifolia Lesser Bulrush	0	1
Typha latifolia Bulrush	4(2)	5(1)
Veronica beccabunga Brooklime	3	1

Infill indicates plants that were dominant or abundant in at least one length; values in brackets are the number of lengths in which these plants were recorded as dominant or abundant.

*One of these lengths was Armley Basin, surveyed in June 2013.

Table 4. No. of species and sum of abundance scores for SSSI canal lengths, June-August 2015.

Leeds & Liverpool Canal	**Canal length**										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Number of species											
Submerged and floating-leaved plants	12	9	9	10	9	9	9	8	7	13	9.5
Emergent plants	16	13	13	10	6	9	10	10	5	6	9.8
All species	28	22	22	20	15	18	19	18	12	19	19.3
∑abundance scores											
Submerged and floating-leaved plants	18	17	15	16	14	17	13	14	11	21	15.6
Emergent plants	22	18	15	12	6	15	14	15	5	7	12.9
All species	40	35	30	28	20	32	27	29	16	28	28.5

Huddersfield Narrow Canal	**Canal length**									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**Mean**
Number of species										
Submerged and floating-leaved plants	1	0	0	2	0	0	0	2	0	0.6
Emergent plants	13	6	6	11	9	4	2	3	1	6.1
All species	14	6	6	13	9	4	2	5	1	6.7
∑abundance scores										
Submerged and floating-leaved plants	1	0	0	2	0	0	0	2	0	0.6
Emergent plants	18	7	7	17	13	5	2	3	1	8.1
All species	19	7	7	19	13	5	2	5	1	8.7

Table 5. Aquatic plants apparently lost from canal SSSIs since notification.

Leeds & Liverpool Canal

JNCC checklist plants recorded at SSSI notification and to 2001 but not in 2013 or 2015	
Submerged and floating-leaved plants	**Emergent plants**
Azolla filiculoides Water Fern[6]	*Apium nodiflorum* Fool's-water-cress[4]
**Ceratophyllum demersum* Rigid Hornwort[1,2,3,4,5,7]	*Carex paniculata* Greater Tussock-sedge[6]
Elodea canadensis Canadian Waterweed[2,3,4,5]	*Carex riparia* Greater Pond-sedge[3]
Juncus bulbosus Bulbous Rush[3]	*Eleocharis palustris* Common Spike-rush[6]
Myriophyllum spicatum Spiked Water-milfoil[2,3]	*Equisetum fluviatile* Water Horsetail[3,4,6]
Nitella flexilis stonewort[6]	*Persicaria hydropiper* Water-pepper[3]
**Potamogeton berchtoldii* Small Pondweed[2,3]	*n* of taxa=6
**Potamogeton obtusifolius* Blunt-leaved Pondweed[2,3]	
n of taxa=8	

[1]Reported in SSSI citation 1984 (Natural England, 2016); also [2]Pre-citation reports, c. 1981-1982 (Knights, 1981, 1982; Anon., 1981); [3]1983 (Anon., 1990); [4]1990 (Anon., 1990); [5]1995 (Anon., 1995); [6]1998 (Anon., 1998); [7]2001 (Anon., 2001). *Recorded in 2012 (Anon., 2013).

Table 5 cont.

Huddersfield Narrow Canal

JNCC checklist plants recorded at SSSI notification and to 1997-1998 but not in 2015	
Submerged and floating-leaved plants	**Emergent plants**
Azolla filiculoides Water Fern[1] *Callitriche hermaphroditica* Autumnal Water-starwort[1] *Ceratophyllum demersum* Rigid Hornwort[4] *Elodea canadensis* Canadian Waterweed[1,2,3,4] *Elodea nuttallii* Nuttall's Waterweed[1,3,4] *Hottonia palustris* Water-violet[1,2] *Lemna gibba* Fat Duckweed[3] *Luronium natans* Floating Water-plantain[1,2,4] *Myriophyllum spicatum* Spiked Water-milfoil[1,2] *Nymphaea alba* White Water-lily[4] *Potamogeton compressus* Grass-wrack Pondweed[1,2] *Potamogeton lucens* Shining Pondweed[3] *Potamogeton natans* Broad-leaved Pondweed[3,4] *Potamogeton pectinatus* Fennel Pondweed[1,2,3] *Potamogeton perfoliatus* Perfoliate Pondweed[1,2,4] *Potamogeton praelongus* Long-stalked Pondweed[1,2,3] *Potamogeton trichoides* Hairlike Pondweed[1] *Sagittaria sagittifolia* Arrowhead[1,2,3,4] *Sparganium emersum* Unbranched Bur-reed[1,2,4] *Spirodela polyrhiza* Greater Duckweed[4] *n* of taxa=20	*Alisma plantago-aquatica* Water-plantain[1,2,3,4] *Carex elata* Tufted-sedge[4] *Carex paniculata* Greater Tussock-sedge[3,4] *Eleocharis palustris* Common Spike-rush[1,2,4] *Equisetum palustre* Marsh Horsetail[4] *Glyceria fluitans* Floating Sweet-grass[4] *Hydrocotyle vulgaris* Marsh Pennywort[2] *Nasturtium officinale* Water-cress[1,3,4] *Solanum dulcamara* Bittersweet[4] *Veronica anagallis-aquatica* Blue Water-speedwell[4] *n* of taxa=10

[1]Reported in SSSI citation 1988 (Natural England, 2016); also [2]1984 (Hill, 1991; Anon., 1996); [3]1991 (Hill, 1991; Anon., 1996); [4]1997-1998 (Pedlow *et al*., 1998).

Conclusions

This article reports work on two canal SSSIs and formed part of a wider study of seven canal SSSIs in the East Midlands and North of England. Discussion of this work on the Leeds & Liverpool Canal and the Huddersfield Narrow Canal will be integrated into a later article that will give an overview of the seven canals. Nevertheless there are some distinct conclusions that can be drawn from the work that is reported here.

Some plants may have been missed, especially sparsely distributed submerged plants, because the survey largely relied on visual observation without the use of untargeted and intensive grapnel hauls. Nevertheless it can be concluded that in 2015 the aquatic vegetation in the Leeds & Liverpool Canal SSSI was markedly richer than in the Huddersfield Narrow Canal SSSI. The Leeds & Liverpool Canal was more species-rich; notably 15 submerged and floating-leaved plants were recorded compared to only five in the Huddersfield Narrow Canal (Table 3). This difference was very well shown by the number of species per canal length (Table 4). Thus in the Leeds & Liverpool Canal the mean number of submerged/floating leaved plants per canal length at 9.5 was very much greater than the 0.6 recorded in the Huddersfield Narrow Canal. Furthermore the mean number of emergent plants per canal length was 9.8 in the Leeds & Liverpool Canal compared to 6.1 in the Huddersfield Narrow

Canal while the mean number of all aquatic plants per length was 19.3 in the Leeds & Liverpool Canal compared to 6.7 in the Huddersfield Narrow Canal. The sum of abundance scores (*∑AS*) which provided an integrated measure of both abundance and species richness was also very informative. The values of *∑AS* for lengths of the Leeds & Liverpool Canal were very much greater than for the Huddersfield Narrow Canal. Thus for submerged/floating-leaved plants mean *∑AS* in the Leeds & Liverpool Canal equalled 15.6 compared to 0.6 in the Huddersfield Narrow Canal while for emergent plants the corresponding values were 12.9 compared to 8.1 and for all aquatic plants 28.5 compared to 8.7.

There have been appreciable changes in aquatic plants and vegetation in both the Leeds & Liverpool Canal and the Huddersfield Narrow Canal since their notification as SSSIs in the 1980s. In the Leeds & Liverpool Canal most change is perhaps shown by submerged and floating-leaved plants. Some of the plants that were formerly abundant, e.g. Rigid Hornwort and Spiked Water-milfoil, were not recorded in 2015. Others, however, remained widespread, e.g. Arrowhead and Unbranched Bur-reed. Essentially, notwithstanding a degree of change, the Leeds & Liverpool Canal continued to host a diverse and abundant community of submerged/floating-leaved plants that included six of the eight pondweeds that were reported in the 1980s. It can also be noted that although Hairlike Pondweed was sparse in Armley Basin in summer 2013, and was not found in the SSSI main-line canal in 2015, it was easy to find in the canal in central Leeds in June 2016. The canal SSSI in 2015 also retained a species-rich emergent community; plants that were considered notable at SSSI notification, e.g. Sweet-flag and Flowering-rush, were still widespread.

Change to the aquatic flora of the Huddersfield Narrow Canal since notification as an SSSI has been more far-reaching. Luxuriant and species-rich vegetation has largely been lost. The substantial rebuilding and restoration of the canal to navigation in the 1980s and 1990s has yielded many environmental, social and economic benefits but it has not been kind to the canal flora. It is puzzling why there has been such a limited recovery of plants and vegetation; possibly the dearth of vegetation in 2015 to a degree resembled the state of affairs 200 years ago when the canal was new, in which case time and patience may be a remedy.

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Drystone walls and the ecology of snails: some preliminary findings

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Introduction

Drystone walls are one of the distinctive landscape features of the Yorkshire Dales. Of variable construction and geology they are integral to the landscape of these Pennine uplands. Whilst recognised for their historical and cultural significance little attention has been paid to walls as a wildlife habitat. The published literature on the ecology of drystone walls is sparse and for the Yorkshire Dales non-existent. Naturalists have appreciated the importance of walls as a habitat for lichens and bryophytes but there has been no systematic attempt to study the ecology of walls in the Dales. It might be expected that these man-made structures would have a close affinity with natural habitats such as scars, scree and limestone pavement, where bare rock predominates with limited availability of soil. Walls also form boundaries between habitats such as woodland, moorland and meadows, providing insights into the interactions of flora and fauna of these diverse ecosystems.

The focus of this study is the distribution of land snails in drystone walls in the Yorkshire Dales National Park (YDNP), the effects of geology on this distribution and a consideration of the possible factors influencing the selection of this habitat by snails.

Some 99 species of land snails can be found in the British Isles (Kerney, 1999), 66 of which inhabit the YDNP. According to the National Biodiversity Network (www.nbn.org.uk), 29

species of land snails have been found in 80% or more of the 10km squares within the Dales and so are considered to be widely distributed across the area. A further 15 have been recorded in between 50 and 80% of the 10km squares. In other words, two-thirds of the species in the YDNP are distributed over more than half of the area. It is possible that some may be under-recorded. For example, the Blind Snail *Cecilioides acicula,* being a subterranean species, is often found only as an empty shell in mole hills. Though it has been recorded in just three of the hectads it may well be more common than we realise.

Not only are the Dales home to a large number of land snails but some of these species are only found in this and surrounding areas. For example, the Craven Door Snail *Clausilia dubia* has a very limited distribution in the British Isles but has been recorded in all but three of the 10km squares in the Dales. The Round-mouthed Whorl Snail *Vertigo genesii* has an even more limited distribution. Only seven populations are known in Britain centred around Upper Teesdale and Blair Atholl. At least one population has been identified near Malham. It appears to be a relic of the late glacial period which is restricted to calcareous flushes, often with arctic-alpine elements of vegetation (Kerney, 1999).

There is also the case of the Kentish Snail *Monacha cantiana* which, it is thought, was introduced to Britain in late Roman times. This snail is common in southern England and has gradually extended its range northwards. So far there are just five hectads where it has been recorded in the Dales (NBN data).

Survey

Drystone walls are three-dimensional structures containing numerous crevices which provide habitats for a surprising range of animal and plant life. Simply inspecting the exterior of a wall may not provide an accurate assessment of the snail fauna within. The alternative, of demolishing sections of wall, was rejected as not being acceptable to landowners! A more practical solution was the removal, inspection and replacement of loose stones as well as a thorough search of any external vegetation. In total 79 c.100m sections of wall were selected for this survey to provide a range of geology, altitude (between 150 and 660m) and distribution throughout the YDNP. Ten random 1m length sections were examined and the snail fauna recorded. Each wall was surveyed twice between April 2015 and February 2016.

There are currently three groups of volunteers who work with the National Park Authority to repair drystone walls which have failed or have been damaged within the YDNP. These repairs usually involve the demolition of the ruined wall along with a section on either side and the setting of the foundations before the structure is re-built. This provided an opportunity for a more thorough examination of the snail fauna and a comparison with a survey of adjacent sections of wall. The nine sections of wall which were 'excavated' included a range of geology, altitude and distribution throughout the National Park.

Results

Table 1 is a summary of the snails found in the 'excavated' walls compared with those in the adjacent sections. It is striking that three of the four non-limestone walls were almost devoid of snails. Just a single Garlic Snail *Oxychilus alliarius* was found in the excavated section at Countersett. Of the other 4 sites more snails were found in the excavated walls compared to

the adjacent sections. In the most extreme example, at Malham, 8 species were found in the excavated section compared to 5 in the adjacent walls. In all cases the excavated sections were limited to 4m in length compared to the longer sections on either side. It also appears that the surveys underestimate the presence of Garlic Snail as well as some of the other snails which are less commonly encountered. This might suggest that some snails inhabit the interior of the wall rather than being found at the surface or that they spend more time in the wall and only come to the surface to feed.

Table 1. Mollusc species recorded in 8 sections of demolished walls.

	Kings-dale	Pen-y-ghent	Counter-sett	Ballow-field	West Shaw Cote	Askrigg	Malham	Embsay Moor
Geology	L	NL	NL	L	M	NL	L	NL
Arianta arbustorum	E						E	
Balea sarsii				E,S	E,S	E,S	E,S	
Cepaea hortensis	S			E,S		E	E,S	
Cepaea nemoralis							E	
Discus rotundatus							E	
Oxychillus alliarius			E	E				
Pyramidula pusilla	E,S			E,S	E,S	S	E,S	
Succinea putris							E,S	
Trochulus striolatus	E,S				E,S	E	E,S	

Key: L=limesone, NL=not limestone, M=mixed geology, E=excavated, S=visual survey.

Table 2 summarises the 79 walls surveyed, including those at the excavated sites. It is clear that the snail fauna of the non-limestone walls was impoverished compared to the limestone or mixed geology walls. Just 6 species were found and these in only a handful of walls. This compares with a total of 18 species found in limestone or mixed geology walls. Statistical analysis (t-test) showed that there was no significant difference between the number of species found in the latter two categories of wall ($p=0.94$, $t=0.07$, $df=34$). When the two groups were combined the most common snails were Rock Snail *Pyramidula pusilla* (85%), *Balea sarsii* (58%), Strawberry Snail *Trochulus striolatus* (46%) and Common Chrysalis Snail *Lauria cylindracea* (22%). The remaining 14 snails were found in less than 20% of walls.

Table 2. Distribution of mollusc species recorded in 79 walls, according to their stone type.

		Limestone (n=30)	Mixed geology (n=29)	Non-limestone (n=20)
Aegopinella pura	Clear Glass Snail	0	1	0
Arianta arbustorum	Copse Snail	4	3	1
Balea sarsii		13	21	4
Cepaea hortensis	White-lipped Snail	8	3	0
Cepaea nemoralis	Brown-lipped Snail	8	2	0
Clausilia dubia	Craven Door Snail	7	2	0
Clausilia bidentata	Two-toothed Door Snail	4	3	0

Cornu aspersum	Common Garden Snail	1	5	0
Discus rotundatus	Rounded Snail	1	0	0
Heicigona lapicida	Lapidary Snail	1	1	0
Lauria cylindricea	Common Chrysalis Snail	3	10	1
Oxichilus alliarius	Garlic Snail	3	1	1
Monacha cantiana	Kentish Snail	0	1	0
Pyramidula pusilla	Rock Snail	25	25	1
Succinea putris	Large Amber Snail	1	0	0
Trochulus hispidus	Hairy Snail	1	1	0
Trochulus striolatus	Strawberry Snail	11	16	3
Vitrina pellucida	Winter Semi-slug	1	0	0

The number of species found in individual walls in the sample ranged from 0 to 8. Table 3 is a summary of the numbers found in walls of differing geology. Only one of the non-limestone walls in the sample of 20 contained 4 species of snails, with the majority (65%) containing none. When the limestone and mixed geology walls were compared the difference in the distribution of the number of snails was found to be not statistically different ($t=0.08$, $p=0.93$, $df=16$). The limestone and mixed geology walls provided the mean number of just over 3 species per wall.

Table 3. Numbers of mollusc species recorded in 79 walls, according to their stone type.

	Numbers of walls		
Numbers of species supported	Limestone (n=30)	Mixed geology (n=29)	Non-limestone (n=20)
0	1	1	13
1	3	4	4
2	7	5	2
3	7	7	0
4	4	8	1
5	5	1	0
6	2	1	0
7	0	0	0
8	1	2	0

One factor limiting the distribution of some snails is altitude (Cameron, 1978), with fewer snails found at higher altitude. Whilst all three types of wall had a lowest altitude of 150m above sea level, the highest altitude for limestone walls was 390m with non-limestone walls reaching 660m. The Pearson correlation coefficient (r) for the complete sample was -0.35 ($p<0.002$, i.e. highly significant, $n=79$). However, altitude only accounted for approximately 12% of the variance in the number of species found. Altitude may be associated with factors such as wind speed, rainfall and temperature which in turn may influence plant distribution and so on. None of these were measured in the present study.

One variable which was recorded was the orientation of the drystone walls. This may provide a crude measure of exposure to sunshine and so temperature. Statistical analysis showed that

there were no significant differences in the number of species found in north/south-facing walls compared to east/west-facing walls (t=0.95, p=0.35, df=30).

Discussion

One could expect any of 22 species of snail to be found in walls (Kerney, 1999). Of these only 10 were encountered in the present study.

Very little has been published on the snail fauna of drystone walls. In 2007 a biological survey was conducted of 74 drystone walls in the Mendips in Somerset (Hill, 2008). Though primarily a survey of the flora, the following snails were recorded: Lapidary Snail *Helicigona lapicida*, Cellar Snail *Oxychilus cellarius*, Rock Snail, Hairy Snail *Trochulus hispidus*, Two-toothed Door Snail *Clausilia bidentata*, Long-toothed Herald Snail *Carychium tridentatum* and Wrinkled Snail *Candidula intersecta*. The number of species appears low for such a calcareous area and distribution maps show that the Mendips have a rich snail fauna (Kerney, *op. cit.*). Though this might suggest that drystone walls have an impoverished molluscan fauna it seems probable that the actual snail fauna may be larger than recorded in this study. Only 3 of these snails were found in the Dales study so it is difficult to make meaningful comparisons.

An earlier study of Slapton Ley in Devon included walls as well as other habitats within the reserve. Chatfield (1972) reported a total of 8 species of snails from the walls: Common Garden Snail *Cornu aspersum*, White-lipped Snail *Cepaea hortensis*, Strawberry Snail, Two-toothed Door Snail, Rounded Snail *Discus rotundatus*, Common Chrysalis Snail, Smooth Glass Snail *Aegopinella nitidula* and Rock Snail. The latter was the only snail in common with the Mendip study. Chatfield concluded that the local geology did not support a calcicole land molluscan fauna. However, the walls included both drystone ones and those pointed with cement. All except the Smooth Glass Snail were also recorded in the present study.

There are two studies of the snail fauna of the Yorkshire Dales that are of particular interest. The first was a comparison of snails living in different habitats in the Malham area (Cameron, *op. cit.*). The second study focused on the snails found in limestone pavements (Willis, 2011). Though neither considered drystone walls, the data presented in them raises interesting comparisons with the present study.

Limestone pavements may at first appear to be horizontal structures and yet the grykes provide a vertical habitat similar in some ways to walls. Of course there are differences in terms of vegetation, humidity, temperature etc. Willis reported much higher numbers of snail species in total as well as for individual pavement sites. Excluding slugs and freshwater snails from her data, there were still 37 species of terrestrial snails recorded, nearly twice the number for drystone walls in the present study. Individual sites ranged from 8 to 24 with a mean of 16.5. This suggests that limestone pavements have a greater diversity of molluscs than walls do.

Cameron's study provided data for ten habitats in and around Malham. These ranged from old rocky woods to grazed grasslands and provide interesting comparisons with drystone walls. He used a Maximum Similarity Index (Southwood, 1966) to compare pairs of habitats using the following formula: MSI = Number of species in common / Number of species in the

less diverse of the two faunas. Using this formula the index was calculated to compare his sample, excluding limestone pavement, with the drystone walls of the present study. Grassy screes and walls were found to be most similar (0.83) with bare screes and walls to be least similar (0.44). Old rocky woods, ungrazed and grazed craggy grass provided similar values when compared to walls (0.78, 0.72 and 0.72 respectively). Grazed grassland with few rocks and other woodland when compared to walls provided another cluster (both 0.67). A total of 30 species of snails were recorded for grassy screes and only nine were found in bare screes, compared to 18 in drystone walls. The other habitats provided values between these two extremes. This would suggest that the fauna of drystone walls is an impoverished fauna of grassy scree yet richer than bare scree.

Another comparison of these habitats, according to Cameron, could be provided by an index of affinity. This index accounted for the frequency of snails in a habitat as well as their occurrence. However, the low frequency of many of the snails in this study casts doubts about the usefulness of this index. It does suggest that the number of species in common between habitats is low. This requires a more detailed consideration of the ecology of species found in walls.

The most frequent snail found in walls was Rock Snail (85%). This tiny mollusc feeds on lichen, algae and cyanobacteria. It was found in the following sites examined by Cameron: old rocky woods, grassy screes, bare screes and ungrazed craggy grass. This range of habitats and its food preferences suggest that this snail would easily adapt to life in drystone walls. The other two most common (*B. sarsii* and Strawberry Snail) were found in about 50% of drystone walls. In Cameron's study *B. sarsii* was found in half of old rocky woods but not in any of the other habitats. It too feeds on mosses, algae, lichens and cyanobacteria which are found living on walls. Strawberry Snail was found in the complete range of habitats which, perhaps, reflects its less specific food requirements. Other alga/ lichen feeders include Craven Door Snail, Two-toothed Door Snail and Lapidary Snail All these three species were found in walls in this study. On the other hand, snails which have been associated with walls, such as Moss Chrysalis Snail *Pupilla muscorum* and Ribbed Grass Snail *Vallonia costata* were not found at all in the present study. Likewise, Mountain Whorl Snail *Vertigo alpestris* and Wall Whorl Snail *V. pusilla* were not encountered in the survey even though both are associated with limestone walls in the Dales (Lindley, 2016).

Snails categorised as soil and litter dwellers (Tawny Glass Snail *Euconulus fulvus*, Toothless Chrysalis Snail *Columella edentula*, garlic snails, glass snails, *Carychium* spp. and semi-slugs) were rarely if ever found in walls in the present study. Although often described as plant or detritus feeders, some show wider feeding behaviour. For example Garlic Snail has been recorded as feeding on algae as well as being a predator of small snails. Smooth Glass Snail has also been recorded as feeding on snails and dead insects and lays its eggs inside moss.

Thus drystone walls may provide differing attractions for individual species. For example, Rock Snail may spend its entire life in or on walls. The algae and lichens living on walls may provide this snail's entire food requirements. Others may spend part of their lives in other nearby habitats and only seek a wall to hibernate, reproduce, as a refuge from predators or as a source of calcium, etc. The diversity of the wall fauna may thus reflect the number of snail

species in the neighbouring habitat. If a wall forms a boundary of an ancient woodland with a rich snail fauna one might expect a greater diversity of snails than a similar wall enclosing heavily grazed grassland. The impoverished fauna of sandstone or gritstone walls may be a reflection of a poor species diversity of a neighbouring acidic grassland habitat rather than due to the lack of calcium as such. This relationship between walls and their neighbouring habitat requires further investigation, as does the interchange of species between both.

Conclusions

More species of snails have been reported in the present study than had previously been published for surveys of drystone walls. However, there were some snails known to inhabit walls which were not found, even though they have been recorded for the Dales. Comparison of the excavated walls with the more superficial examination of walls showed that the survey probably underestimates the number of species found to inhabit walls. Comparisons with other snail faunas in the Dales would suggest that drystone walls provide a habitat richer than bare scree but poorer than grassy scree. Further work on the snail faunas of neighbouring habitats as well as the availability of food sources on walls should provide a fuller understanding of the ecology of drystone walls. In addition the 'missing' wall species need to be sought in further survey work.

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A key to the parasitoids of *Coleophora serratella* (Linnaeus, 1761) - a work in progress!

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Introduction

The life-cycle of the micro-moth *Coleophora serratella* is well-documented and it is probably one of the most intensively studied species in its genus. The larva is a case-bearing leaf-miner of various deciduous trees but in the United Kingdom is mostly associated with birch. The early mine is a gallery but this is soon widened into a blotch that can be excised by the young larva to create its distinctively angled first case in which it spends the winter. In early May the caterpillar cuts out a segment from the edge of a new leaf and from this segment forms the characteristic serrated-edged cigar-shaped second case.

For the last few years I have been collecting batches of these second cases and rearing them through to maturity so that any emerging parasitoids can be collected and identified. It seems that there are relatively few species of parasitic hymenoptera that specialise in attacking *Coleophora serratella* but other, more generalist parasitoids are also occasionally involved. I have attempted here to produce a simple key that should assist in the identification of the more regular culprits.

Methods

Each year, *C. serratella* cases are collected from birch woodlands and each is reared individually on a single leaf in its own transparent plastic pot. These containers are then kept in an un-heated outdoor shed and regularly checked to avoid mould and condensation. A small piece of absorbent tissue paper is usually added to each pot to combat these potential hazards. Adult moths will usually emerge in the first week of July with parasitoids following shortly afterwards.

For example, on 30 May 2016 I collected twenty-six *Coleophora* cases from birches at Timble Ings, North Yorkshire, VC64. The first moth emerged on 29 June and the last one on 17 July. The peak of the moth numbers occurred on the 2 & 3 July and the only two parasitoids from this batch appeared on 14 & 17 July. This is an unusually low rate of parasitism and in most years the numbers of parasitoids collected is considerably higher.

Adult parasitoids usually only survive for a few days in their containers and once they have expired they are easier to examine. I have found that the specimens can be perched on cocktail sticks to facilitate macro-photography and to achieve good views of their wing venation patterns. A 56x microscope is useful in this regard. [Editor's note: Paul Richards (Sheffield University) has demonstrated that a mobile phone with a macro lens attachment will allow enlargement of the image. This may prove to be an acceptable alternative to buying a microscope.]

My first attempt at a draft key was published in *The Bulletin of the Amateur Entomologists' Society* in June 2015 but there were a couple of confusing printing errors, as well as a reference to an illustration that was in fact not published, presumably due to space constraints. This original draft key also failed to include the apterous *Gelis* species, a pair of which turned up in a Timble Ings sample shortly after publication. I have therefore updated the key here:

A key to the identification of parasitoids of *Coleophora serratella*

1. Forewing with more than two cells.....2
Forewing with no cells .....Chalcidoidea
No wings.....Consider the possibility of an apterous *Gelis sp*.

2. Forewing with typical Braconid-type wing venation* 3
Forewing with typical Ichneumon-type wing venation*.....4

3. Wings transparent .....***Dolichogenidea breviventris*** (Ratzeburg,1848)
Wings have 'smoked glass' appearance ..... ***Agathis mediator*** (Nees, 1814)

4. Clouds of pigmentation on the forewing .....Female ***Gelis areator*** (Panzer, 1804)
No clouding of forewing.....5

5. Sturdy ovipositor, as long as abdomen ..... ***Scambus* spp.**
Ovipositor narrow and shorter than abdomen.....6

6. Legs mostly reddish amber with small areas of black .....Male ***Gelis* spp.**
Legs (particularly hind tibiae) have significant amounts of yellow and black.....7

7. Nervellus angulated; glymma absent ..... .***Campoplex punctipleuris*** Horstmann, 1980
Nervellus straight and glymma present ..... ***Diadegma*** spp.

***Wing venation**

The presence of a second recurrent vein (2m-cu) distinguishes Ichneumonidae from Braconidae. The discosubmarginal cell of Ichneumonidae has the appearance of a horse's head (see Fig.1).

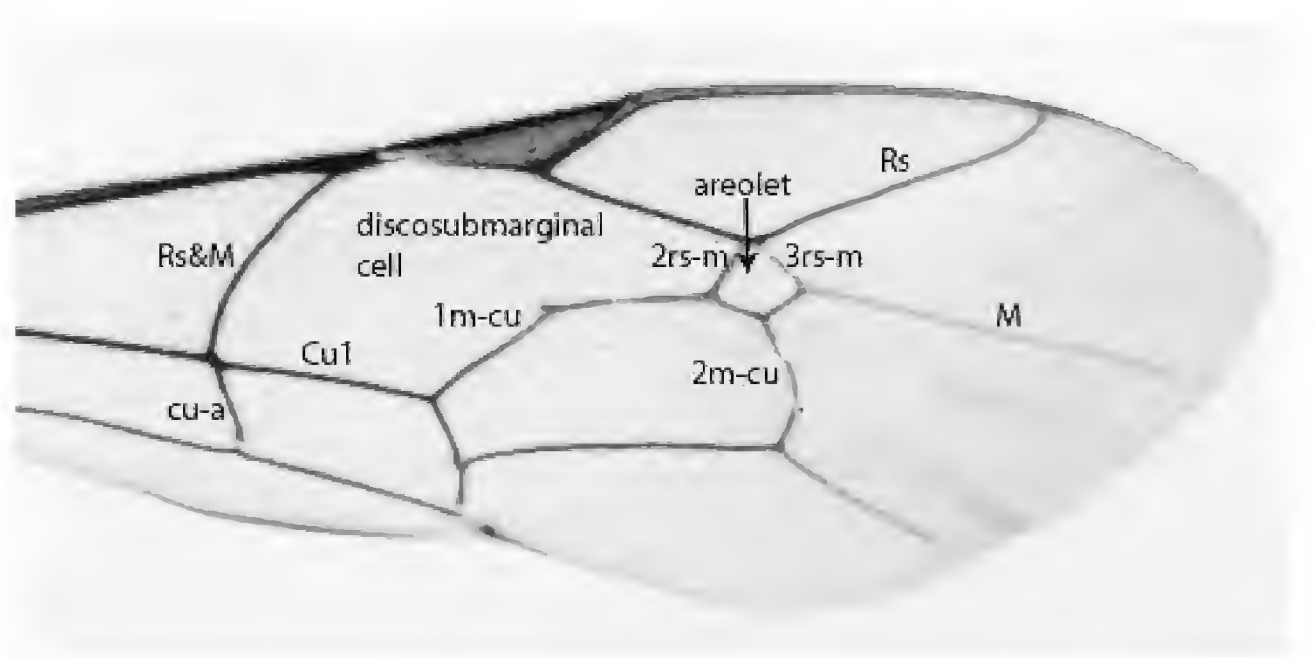

Figure 1. Ichneumon-type wing venation

Species accounts of the parasitoids of *Coleophora serratella*

Braconidae: Microgasterinae

Dolichogenidea breviventris (Ratzeburg, 1848) is probably the commonest braconid parasitoid of *Coleophora serratella* in Great Britain. It usually emerges at the end of July and early August after the host's peak emergence.

Braconidae: Agathidinae

Agathis mediator (Nees, 1814) is a common parasitoid of oak-feeding *Coleophora* but does certainly also occur ex *C. serratella* (Mark Shaw, 2014. pers.comm.).

Ichneumonidae: Pimplinae

Scambus species develop as solitary ectoparasites and have a wide host range. They are only occasional parasitoids of *Coleophora serratella*.

Ichneumonidae: Cryptinae

Gelis areator (Panzer, 1804) is a common parasitoid of *Coleophora serratella* and the females are the easiest to recognise because of their characteristic wing markings. The adults tend to emerge in August after the host's flight period. Other *Gelis* species do occur and the males particularly are notoriously difficult to identify, often referred to as "the impossible male *Gelis*!"

Ichneumonidae: Campopleginae

Campoplex punctipleuris Horstmann, 1980 is a common parasitoid of *Coleophora serratella* in England and usually emerges in early July. Unfortunately, Klaus Horstmann does not seem to have produced one of his characteristic illustrations of this species' distinguishing features (but see Fig.2). Eventually I hope to be able to examine enough specimens of this species to determine whether the apparent angulation of vein 3rs-m (which forms part of the areolet) is a consistent feature.

Diadegma species are less common and tend to be the last parasitoids to emerge from *Coleophora serratella*, sometimes as late as September.

Fig.2. *Campoplex punctipleuris* Horstmann, 1980. Note the yellow (pale) and black markings on the legs and the "horse's head shape" of the discosubmarginal cell in the wing venation. D. Parkinson

Chalcidoidea

There are currently 11 Chalcidoid associates of *Coleophora serratella* listed on the Natural History Museum's (NHM) Universal Chalcidoidea Database. However, I am aware of several other species that are not yet listed there. This is a very difficult group and there is obviously much work still to be done here. I would suggest using the online key to the parasitoids of *Cameraria ohridella* to allocate chalcid specimens to their sub-families and then comparison can be made with the species listed on the NHM Database.

Discussion

This key covers only the parasitoids that are most likely to be encountered from collected specimens of *Coleophora serratella* in Yorkshire. The host is widespread throughout Europe, Asia and North America and the parasitoid complexes will differ in each area. Klaus Horstmann, for example, described *Campoplex serratellae* in Germany but this species has not yet been reliably recorded from Britain. There is always the possibility that another generalist parasitoid will opportunistically attack *C. serratella* if it encounters it. In reality though, the vast majority of parasitoids obtained will be one of the top three i.e. *Campoplex punctipleuris*, *Dolichogenidea breviventris* or a *Gelis*. This makes this host species the perfect introduction for anybody wanting to study the hymenopterous parasitoids of lepidoptera.

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Recent observations on *Agrypnetes crassicornis* (Trichoptera: Phryganeidae) the Malham Sedge, Yorkshire's critically endangered caddisfly

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The Malham Sedge *Agrypnetes crassicornis* (McLachlan) is a caddisfly only found in one locality in Britain, Malham Tarn in the Yorkshire Dales National Park. We previously (Flint & Flint, 2015) reported that this insect had been seen as an adult (a single female) at Malham a couple of weeks outside its known and published (Barnard & Ross, 2012) flight period. This year the status of this caddisfly has been upgraded from Endangered (Shirt, 1987) and RDB1 (Wallace, 1991) to Critically Endangered (Wallace, 2016).

On the morning of Saturday, 6 August 2016, whilst wading in the edge of the Tarn at Ha Mire demonstrating the method of pond net sampling to a group of students, one of us (SF) found an adult female Malham Sedge clinging to her leg just above the knee. On emptying the contents of the net into a sorting tray a number of large, phryganeid-looking pupal exuviae were seen and, on returning to the FSC laboratory, two of these were identified as Malham Sedge (one male and one female). Due to the time commitments of the course we were teaching we were unable to return to the Tarn shore until the late afternoon of Monday 8 August, when we spent some time examining the wind-blown foam on the eastern shore between Ha Mire and the wood near the East Boathouse. During the previous week there had been strong westerly winds with torrential rain and, we were informed, this foam had been blown several metres up from the edge of the tarn. The wind had subsided but there was still a westerly breeze and the foam, which was still coming ashore, was piled several centimetres deep in places among the rocks. Four dead adult Malham Sedge, two of each sex, were found trapped in this foam and we managed to release two which made off into shelter among the rocks. There were also several pupal exuviae trapped in the foam. Two male and two female adults had made it ashore by their own efforts and were sheltering among the rocks at the water's edge at well-separated points.

We also looked at the northern shore of the Tarn around the East Boathouse where we found more pupal exuviae among dry debris well above the water level. No more adult Malham Sedge were seen but several adults of another phryganeid, *Agrypnia obsoleta* (Hagen), were flying at about 17:30. These pupal exuviae proved to be mostly Malham Sedge and we presume, in view of the fact that there was an abundance of *A. obsoleta* (of both sexes) flying, that the other phryganeid exuviae were this caddisfly. Exuviae numbers are shown in Table 1.

We returned to Malham on the following afternoon to make more observations along the northern shore of the Tarn. Two adult Malham Sedges were found: a male sheltering under a stone above the water level directly below Tarn House and a female sitting on a partially

submerged rock, completely surrounded by water, under the trees near the East Boathouse. There was only a slight breeze and there was only ripple action along the northern shore. There were large numbers of pupal exuviae just at the water's edge and a one metre stretch of shoreline was harvested. This yielded 46 Malham Sedges which, taken together with the numbers of exuviae seen on the 6th and 8th, indicates that large numbers of larvae made it as far as pupation and adult emergence this year, even though we only saw a total of 12 adult specimens.

Table 1. Numbers of Phryganeid pupal exuviae collected on the shore of Malham Tarn 6, 8 & 9 August 2016.

Location and date	***Agrypnetes crassicornis***		***Agrypnia obsoleta***	**Undetermined**
	Males	**Females**		
East Shore 6/8/16	1	1	1	1
East Shore 8/8/16	8	11	2	2
East Boathouse 8/8/16	9	4	5	2
North Shore 9/8/16	29	17	4 (3 male 1 female)	

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Carrion Crows with white/grey feather markings

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Carrion Crows *Corvus corone* with white feathers (pure white and leucistic) are mentioned in books about Yorkshire birds (Chislett, 1952; Mather, 1986). More recently several Carrion Crows with piebald feathers (particularly on the wings) have been seen near Scarborough (Leyland, 1998), around Filey (Lombard, 2012) and in East Park, Hull (Gomez, 2014). Elsewhere in Northern England increasing numbers of Carrion Crows with white markings on their wings have been reported along the coast in South Northumberland (see comment by Northumbrian Birding in response to the blog by Gates, 2012).

In France, Belgium and Switzerland there are apparently some places where it is claimed that 30-50% of the Carrion Crows have white markings, mostly on their wings (Malher, 1998)

Fig 1. Carrion Crows *Corvus corone* with white/grey markings on their wing feathers. Crow A on left, Crow B on right. *R. O. Shillaker*

Two Carrion Crows with white and/or grey markings on their wings appeared in Brantingham, East Yorkshire, during the summer of 2016. Crow A had extensive areas of white and grey on both wings. Crow B had a few very small patches of white/grey colouration on predominantly black wings. Photographs (e.g. Fig.1) taken at some distance on 14 September 2016 indicate that most (perhaps all) of the feathers with white and/or grey colouration on Crows A and B were not uniformly coloured, i.e. they had varying amounts of white/grey and black. No white/grey areas were noted on feathers on other parts of the body of these Crows (although I had less good views of Crow B) and there was no abnormal colouration of their legs, feet or eyes.

I first spotted Crow A in Brantingham on 9 August 2016, when I also noted that it had brownish feathers on its head and neck (no brown colouration was noted later in the summer) which indicated that it was a young bird hatched earlier that year. Crow B was noted some weeks later perched close to Crow A. These two birds were then seen a few times together around the village in August/September (dates not recorded). I therefore thought that both birds might be related and that the white/grey feathers might have had an inherited (genetic) basis. Hence I initially regarded these birds as leucistic.

Leucism (also called partial albinism) can be defined as a partial or total lack of eumelanin (the black pigment in the Carrion Crow) and/or phaeomelanin (a brown pigment) in the feathers as a result of an inherited disorder in the deposition of these pigments (van Grouw, 2006). A leucistic bird can sometimes lack melanin from other parts of its body but will always have normal coloured eyes (Guay *et al.,* 2012), i.e. not the red or pink eyes of a true albino.

van Grouw (*loc.cit.)* notes that a leucistic bird typically has all or some feathers that are totally white and states that:

> "Partly coloured feathers are very unusual in leucism. Individual feathers that are partly coloured usually indicate a bad condition of the bird during feather growth and is not an inheritable character (i.e., is not leucism). This is often seen in, e.g. Carrion Crows, especially those eating junk food in cities."

As Crows A and B appeared to have no totally white feathers it raises the possibility that diet played a part in their banded feather colouration. In the case of Crow A, which is believed to be a young bird, the parents may have fed it a suboptimal diet. There was probably only limited opportunity for the parent birds to find discarded takeaways but other unwanted human food might have been available.

Although van Grouw does not provide any references in support of his proposal that diet can play a part in causing white feathers, a review of plumage aberration by Guay *et al.* (2012) mentions two studies suggesting a link between protein intake and plumage whitening. Guay *et al.* note that a deficiency in the amino acid lysine was linked with whitened plumage in bronze turkey poults (Fritz *et al.,* 1946). They also note that a protein-deficient diet was associated with whitened plumage in Blackbirds *Turdus merula* and may cause high levels of whitened plumage in this bird in urban areas of Newcastle compared with rural areas of Northumberland (Rollin 1953, 1959).

Both the above feeding studies were conducted on captive birds. A field study of Hooded Crows *Corvus cornix* in Norway, which included the interchange of eggs and hatchlings between nests, indicated that the occurrence of partial albinism may be related to the feeding conditions during the nestling stage rather than to any genetic differences (Slagsvold *et al*., 1988). Fledglings and juveniles with partial albinism were typically small sized, as measured by the length of certain bones and feathers. However it was unclear whether the partial albinism was due to starvation, an unbalanced diet or eating poisonous food. This study adds further weight to the possibility that diet played a part in the atypical feather colouration of the two Brantingham Crows.

At the time of writing this note (early October 2016), Crow A with its distinctive black and white wings was still to be seen in the village. Crow B had not been definitely identified for a few weeks, although a Carrion Crow with apparently a small patch of grey on at least one wing was seen on its own on 1st October.

It is known that the degree of partial albinism may change with the age of an individual bird (references cited by Slagsvold *et al*., *loc. cit.)*. Unfortunately, as Crow A had not been individually colour ringed it would not be possible to monitor with confidence any future change in its plumage colouration following moulting.

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Field Note: 'Extinct' plant found near Kendal

Pete Shaw
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Whilst walking in the limestone area near Kendal recently I found a plant which is so rare I thought it may be of newsworthy interest. My photograph (Plate 6, centre pages) shows the plant in flower which I believe to be Red Hemp-nettle *Galeopsis angustifolia*.

Many years ago this used to be a fairly common plant which could be found throughout the UK but with changes in land use its numbers have declined to the point where it is now a great rarity. The 1998 Flora of Cumbria regarded it as 'extremely rare' and in the 2015 Rare Plant Register of Cumbria it is cited as being 'nationally scarce and critically endangered' and 'may well now be extinct in Cumbria'. So it is very pleasing to be able to give a positive update and confirm that it does still grow and flower near Kendal.

The plant is quite small. The most robust specimen I saw was only 8 inches tall and was growing in a very fragile environment where it could easily be accidentally damaged. There was a small colony of 34 plants, 10 of them flowering. I hope that this group of plants will be able to set seed and prosper, thereby maintaining a population into the future.

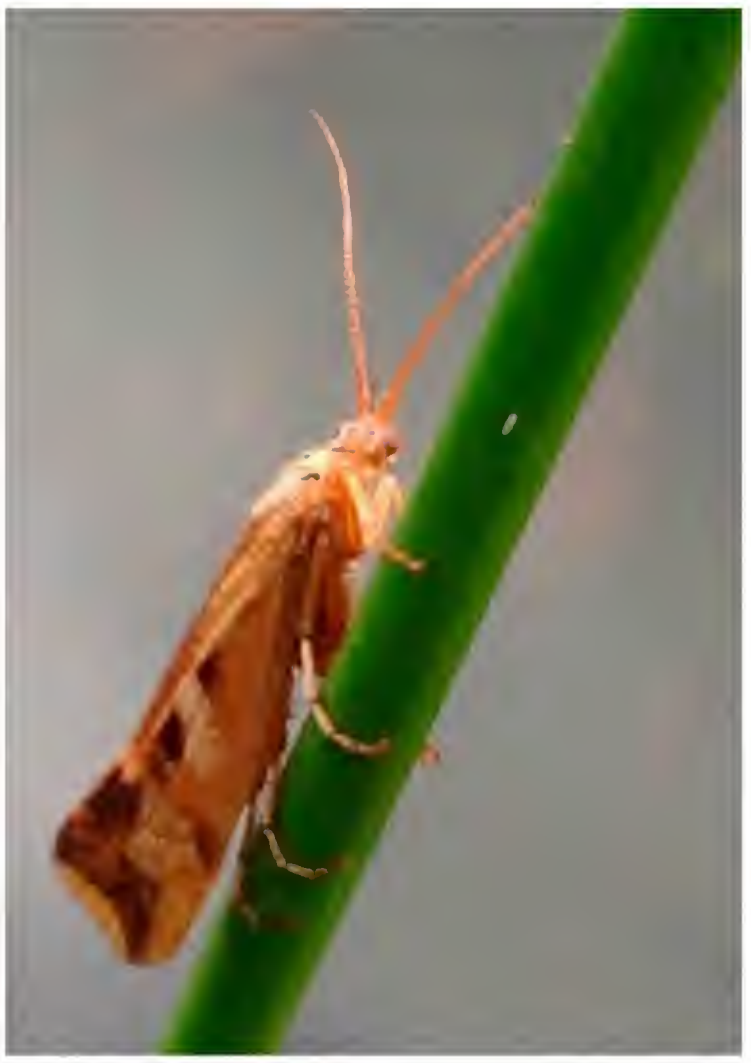

Plate 1. Moth trapping for 'river flies'. See p163.
Limnephilus lunatus, a caddisfly which can be identified from a good photograph. S. Flint

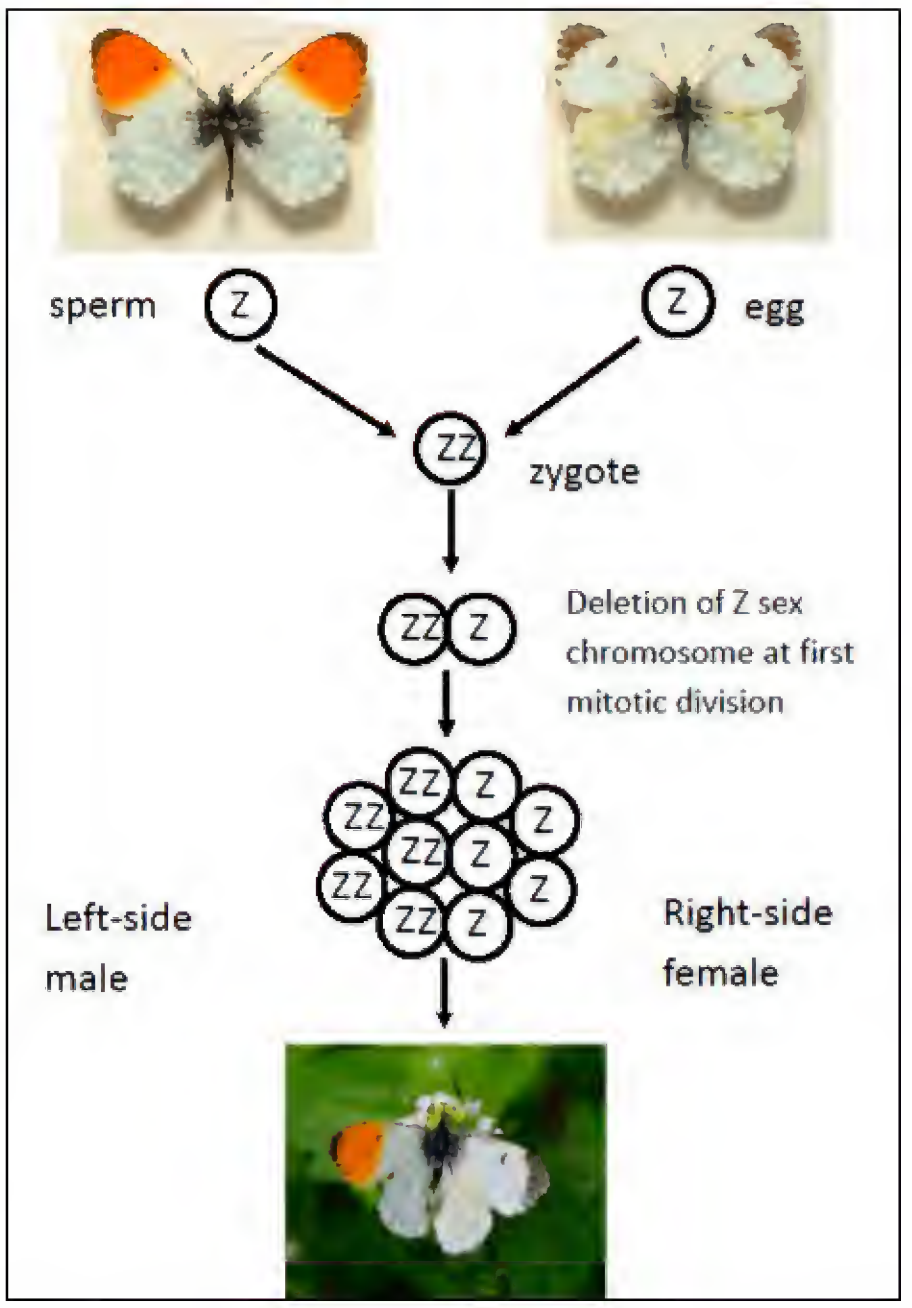

Plate 2 (*Right*). A gynandromorph Orange-tip *Anthocharis cardamines* butterfly (see p167). Schematic diagram showing genesis of the bilateral gynandromorph form where the Z sex chromosome has been lost at the first mitotic division.
Adapted and redrawn from Harmer & Russwurm (2000). Typical male and female Orange-tip (top left and right respectively): images are from the collection of Cologne Zoo, Germany. https://commons.wikimedia.org/wiki/File:Anthocharis.cardamines.mf.mounted.jpg by Sarefo Multi-license with GDFL and Creative Commons.

Plate 3. SSSI canals: Leeds & Liverpool Canal (see pp169-185).
Left: A rural section towards the western extremity of the SSSI. The wide cycle path and mown grass emphasize a focus on recreational use; sheer sides discourage development of emergent marginal vegetation. June 2015.
Right: Broken-down or silted margins allow development of intermittent emergent vegetation dominated by Reed Sweet-grass *Glyceria maxima*. July 2015. R.Goulder

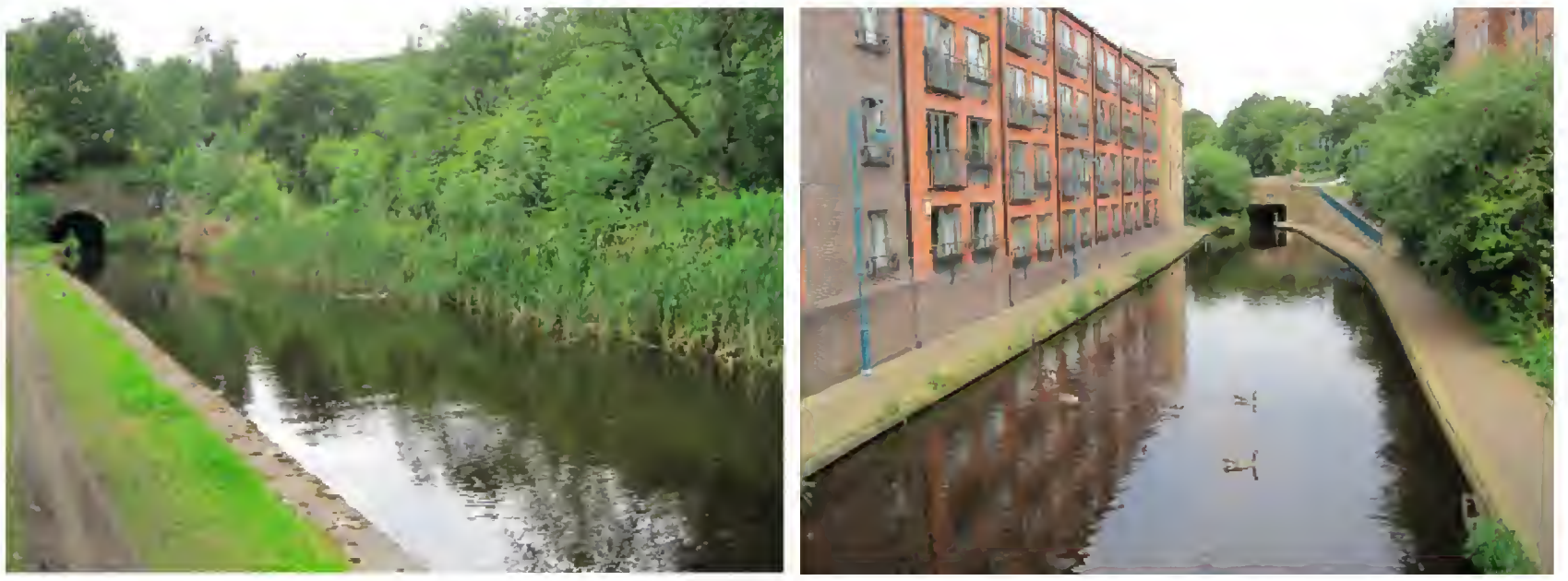

Plate 4. SSSI canals: Huddersfield Narrow Canal (see pp169-185).
Left: The sheer masonry wash wall along the towing path discourages marginal vegetation but Bulrush *Typha latifolia* is established along the silted far side. August 2015.
Right: The restored urban canal in Stalybridge has recent property development, footpaths and lighting but the deep turbid water and hard sides make a difficult habitat for aquatic plants. August 2015.
R. Goulder

Plate 5 (above).
Malham Sedge *Agrypnetes crassicornis* female on the north-east shore of Malham Tarn 2016. (see pp196-7). S. Flint

Plate 6.
Red Hemp-nettle *Galeopsis angustifolia*, photographed near Kendal (see p200).
P. Shaw

Plate 7. VC65 Excursion to Marrick Park, Swaledale (see p221).

Above left: View south-west across the R. Swale from Thorny Park towards Stainton Middle Wood.

Above right: Meadow Saxifrage *Saxifraga granulata*.

Left: Annelid trails in a sandstone orthoclast in a boundary wall of High Park.

T. Whitaker

Plate 8. VC61 Excursion to Wharram Percy Medieval Village (see p223).
Left: Field Pansy *Viola arvensis*.
Right: The hoverfly *Cheilosia illustrata*, identified by Roy Crossley. One of the few members of this species-rich hoverfly genus which can be named with certainty from a photograph. K. White

Plate 9. VC62 Excursion to Ashberry YWT reserve (p227). *Left*: Marsh Helleborine *Epipactis palustris*. *Right*: Round Mouthed Snail *Pomatias elegans*. *Top*: Animal withdrawn, with the operculum closing off the shell mouth. *Lower*: Shows operculum on the body of the animal and also the eye at the base of the tentacle, another feature of the group to which it belongs. T. Wardhaugh

Plate 10 (above). VC63 Excursion to Austerfield Mosaic Trust Reserve, nr Bawtry (see p228). *Left*: Privet Hawk-moth *Sphinx ligustri,* which came to light traps set the evening before the main meeting.
Right: Joint VC63 Botanical Section Recorders Kay McDowell and Louise Hill examining the flora of this dry sandstone reserve. J. Simmons

Plate 11. VC64 Excursion to Ingleborough Nature Reserves (see p234).

Left: Ancient wall near Colt Park Wood.

Right: The rove beetle *Dianous coerulescens at* Colt Park Wood.

T. Whitaker

What's hit is history: Key Yorkshire bird specimens in the collections at Whitby Museum: a tribute to Thomas Stephenson

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Biographical notes on Thomas Stephenson (12.2.1833 - 19.2.1916)
This study is presented as a tribute to Thomas Stephenson on the centenary of his death in 1916.

He was born in Whitby and his education, which commenced at Rev. Benjamin Richardson's establishment in Glaisdale, continued at the Rev. Thomas Irvine's academy in Ormesby, Middlesbrough, and was completed at the ancient and celebrated St. Peter's School in York. It was at Glaisdale and Ormesby that his interest in natural history commenced and continued throughout a long, well-filled and useful life. By profession Thomas was a solicitor, joining his father Mr Appleton Stephenson in the family practice located close to the Seamen's Institute in Haggersgate in 1854. After the death of his father Thomas continued the practice with his brother John Boyes Stephenson and until his own death he was Whitby's oldest practicing solicitor.

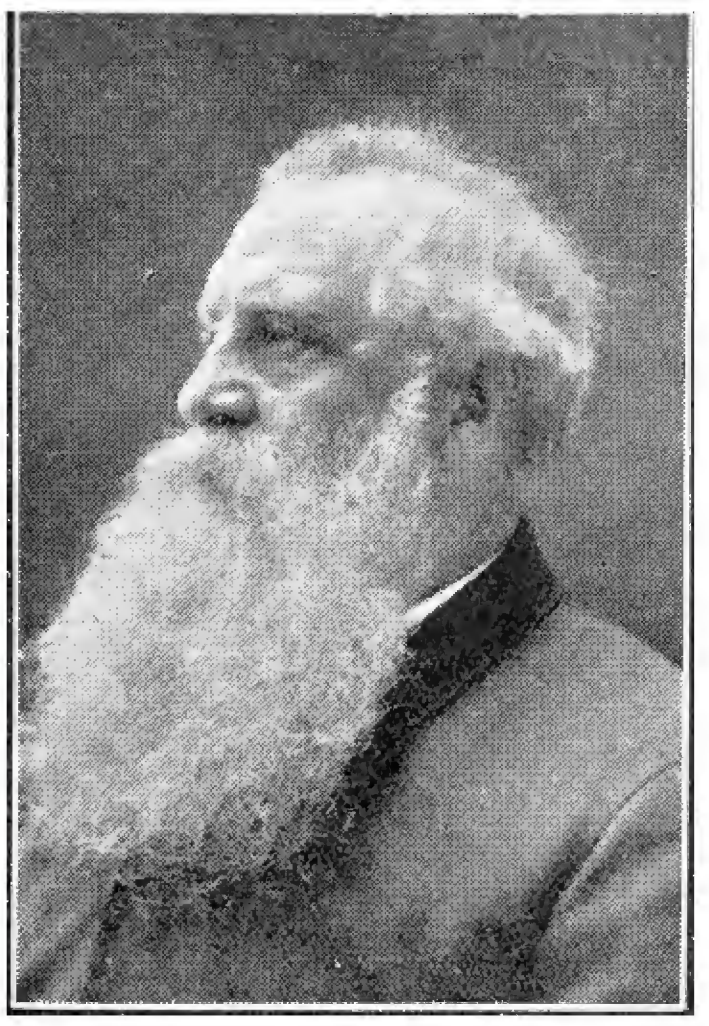

Figure 1: Thomas Stephenson - solicitor, naturalist and curator of Whitby Museum.

He was interested in dialect studies and folklore, assisting the compilers of local glossaries and was a correspondent of the English Dialect Society. In early life he was a good all-round sportsman, a fearless rider to hounds, a skilful angler and a good shot, and became a member of the Old Whitby Volunteer Corps when it was founded.

Joining the Whitby Literary and Philosophical Society in 1861, he instigated the formation of a local natural history collection in 1864, becoming an Honorary Curator of Natural History in 1880 and remaining active in this post until his death in 1916.

Some of Stephenson's earliest natural history records appeared in Clarke & Roebuck (1881). In response to appeals from the authors, Stephenson was one of 59 contributors who provided lists of mammals, reptiles and freshwater fish; he was also one of 37 who provided lists of birds and one of only seven specialists contributing lists of marine fish. He is listed amongst the 223 financial subscribers to this key Yorkshire volume and was highlighted in the

acknowledgements "for the very kind manner in which numerous queries were replied to". The supplement to the *Handbook* (Clarke & Roebuck, 1883-84) included additional Whitby district records from Stephenson. He also corresponded with Thomas Nelson over the compilation of *The Birds of Yorkshire* (Nelson, 1907).

Stephenson became a prolific contributor of field notes and records to the regional literature; these were largely on birds and marine fish but also included mammals, crustaceans and cephalopods. A bibliography of his published output is included in the following references. His records were frequently made the more complete by naming the associated sportsmen, gamekeepers, bird-catchers and taxidermists, also by naming the estate on which the specimen had been killed, and noting whether the specimens had been acquired for Whitby Museum. This provided an invaluable social history and collections research perspective to his records. Amongst his notes three were of birds new to Yorkshire, the Lesser Grey Shrike (Stephenson, 1906), Lapland Bunting (in Nelson, *loc. cit.*) and the Little Bunting (Stephenson, 1913) and, amongst his fish notes, Muller's Topknot *Zeugopterus punctatus* (Stephenson, 1884-85b), the flying fish *Exocetus exiliens* (Stephenson, 1894) and Couch's Whiting *Micromesistius poutassou* (Stephenson, 1896) were claimed as new county records.

Roebuck (1916) noted that it was always a pleasure to call upon him at his residence at Pier-side, Whitby, or to find him actually on the pier or in the fish market, to enjoy his genial conversation and to draw upon his never failing store of local knowledge. It was at the Pier-side, within sight of the old harbour he loved so well, that he died at the age of 83 years.

Key Yorkshire bird specimens in the collections at Whitby Museum:

Introduction

Prior to the availability of appropriate bird-watching optics, popular identification guides or high quality wildlife photography, the only means of authenticating the occurrence of most vertebrate creatures depended on the chance finding of dead or injured specimens or the fatal results of hunting, shooting, fishing, gamekeeping and pest control. In Nelson's encyclopaedic two volume work (*l.c.*), the usage of terms for killing specimens features 1,094 times (see Table 1), a contrast with the post-war YNU annual bird reports based almost entirely on observations, descriptions and humane trap and release.

Table 1: Usage of terms of lethal acquisition in Nelson (*l.c.*)

How acquired	Number of examples
Trapped	27
Caught	41
Shot	228
Taken	368
Killed	430
Total	1,094

Indicating the importance of 19th century museum collections in reviewing the county's avifauna, Nelson makes 146 references to specimens in 23 museum collections (public, private and University) throughout the United Kingdom. Institutions providing in excess of ten references each are shown in Table 2.

Cultural mores towards the above activities have varied across the generations with animal welfare and conservation concerns creating in some circles a misguided disapproval of museum collections. Sadly the research and educational significance of museum specimens also became embroiled in these concerns. Unlike records surviving purely in published, archival or photographic form, the physical evidence of museum voucher specimens is available for taxonomic re-examination, forensic research and increasingly for DNA analysis.

Table 2: References to museum specimens in Nelson (*l.c.*) where more than ten references were made

Museum	No. of References
Whitby Museum	11
Scarborough Museum	15
*Tunstall (Wycliffe) Museum	18
Hull Museum	21
Yorkshire Museum	34

* Now in the collections at Dorman Museum, Middlesbrough.

Inventory of notable birds

The following collections-research project seeks to highlight key specimens in the history of Yorkshire ornithology currently or formerly held in the Whitby Literary and Philosophical Society's natural history collections at Whitby Museum. Items have proved to be remarkably well documented in the literature and the exercise has been useful in assembling a substantial bibliography for the assistance of collections documentation. The exercise also highlighted the importance of Thomas Stephenson, honorary curator of natural history from 1880 to 1916, in forming the core of the local material and in generating the extensive supporting literature (see bibliography and appendix).

White-billed Diver *Gavia adamsii*

Through the work of Burn & Mather (1974) and Mather (1975), Yorkshire specimens collected during the 1950s have a particular significance in elucidating identification characteristics of the winter and immature plumages of this rare and impressive high arctic, tundra zone vagrant.

An oiled bird found at Sandsend on 10 February 1952 died shortly after being taken to Mr A.B. Walker, who arranged for it to be preserved as a cabinet skin for Whitby Museum. It was prepared at the Hancock Museum, Newcastle, and sent for confirmation to the Natural History Museum (formerly the B.M. Nat. Hist.). This proved to be the third authenticated Yorkshire record. Sadly the skin is now lost but fortunately the bird was photographed before it died and the occurrence is well documented (see Walker, 1952; Wallis, 1952).

The fifth Yorkshire record, also of an oiled bird, was found at Saltwick Nab, Whitby, on 17 March 1956 and taken to A.B. Walker, who had it prepared as a mount for Whitby Museum. It was examined by J.R. Mather who confirmed its identity but found it in a poor state of preservation.

Full details of the above are reviewed in Burn & Mather (1974) and Mather (1975). Though no records of White-billed Diver exist in the accession registers (Denise Gildroy *pers. com*. 12.05.2016) a mounted specimen in winter plumage in case 59 could be the 1956 bird.

Little Bittern *Ixobrychus minutus*

Nelson (*l.c.*) was able to cite 15 authenticated Yorkshire records. These included a specimen captured by T. Fletcher in May 1877 at Ruswarp Dam which was acquired by Whitby Museum (Stephenson MS in Nelson) and, according to Mather (1986), represents the tenth county record. Curiously, the accession documents make no mention of this specific bird but list donations of un-provenanced Little Bitterns for 1827 from E. Corner and 1873 from W. Thompson (Denise Gildroy *pers. com*. 12.05.2016). These last two specimens do not match any of those listed by Nelson. The mounted specimen (WHITM:ORN30) with a broken upper mandible in case 59 labelled as "rare visitor" could be any or none of these three birds.

Night Heron *Nycticorax nycticorax*

Nelson (*l.c.*) knew of four 19th century Yorkshire records, including an adult specimen captured during the autumn of 1861 on the Esk about a mile upstream of Ruswarp. This, according to Thomas Stephenson, was in the collection of Mr Edward Corner of Esk Hall (Clarke & Roebuck, 1881). On 26 October 1911 an immature female was shot on Ruswarp Carrs (Stephenson, 1911). The specimen (WHITM:ORN27) is displayed in case 59 and its donation to the Whitby Literary and Philosophical Society is recorded in the annual report for 1911 (Denise Gildroy *pers. com*. 12.05.2016). The Ruswarp records represent the third and fifth Yorkshire records respectively (Mather, 1986).

Purple Heron *Ardea purpurea*

Up to 1996 there were 48 authenticated Yorkshire occurrences but it was evidently rare during the 19th century with only six records. Its rarity evidently continued until the mid-20th century with all subsequent records dating from 1966 (Wilson & Slack, 1996).

A mature specimen was at Ruswarp in the summer of 1850 (Clarke & Roebuck, 1881), subsequent reviewers referring to the year as 1860. It was shot by Joshua Barry, preserved and mounted by J. Kitching and was acquired by Whitby Museum. This bird (WHITM:ORN28) displayed in case 59 probably represented the fourth Yorkshire record (Mather, 1986). Sadly no accession documentation can be traced for this specimen (Denise Gildroy *pers. com*. 12.05.2016).

Glossy Ibis *Plegadis falcinellus*

"Breeds very discontinuously from the Balkans to southern Asia, Indonesia and Australia; southern Africa and the Caribbean" (Sharrock & Sharrock, 1976). Until recently it bred no nearer to Britain than [the former] Yugoslavia where there were 4,500 breeding pairs in 1869. This figure had reduced to 600 by 1931 and by the 1980s there were probably fewer than 100 pairs (Mather, 1986). Even at the close of the 19th century its Yorkshire status was described as an "Accidental visitant from central and southern Europe and Africa, of extremely rare occurrence" (Clarke & Roebuck, 1881) and up to 1909 there had only been six verified Yorkshire occurrences (Nelson, *l.c.*; Chislett, 1952; Mather, 1986).

From early October to November 1909 an unprecedented influx of Glossy Ibises dispersed to England; about fifteen (of which 10 were shot) reached the Yorkshire region from the north Nottinghamshire border, through coastal Holderness and north to Cleveland.

On 20 October one was shot at a "quiet marshy spot about a mile from the sea" at Old Hall Farm, Ruswarp (NZ8809). The specimen, in winter plumage and described as being "remarkably fine", was acquired by the Whitby Literary and Philosophical Society and the skin preserved and mounted for Whitby Museum (Stephenson, 1909). This elegant specimen (WHITM:ORN32) still features in the museum displays (case 59) where it is labelled as "Extremely rare. Shot Ruswarp 1909".

While generally declining in Europe, the Glossy Ibis has recently established a breeding colony in southern Spain and there appears to be a growing trend for the Spanish birds to winter in Britain and Ireland, with at least 22 sightings in 2010 (Hudson *et al.,* 2010).

Spoonbill *Platalea leucorodia*

The specimen (WHITM:ORN31) in case 59, its label stating "Rare chance migrant", could be the immature Spoonbill found dead on the beach at Saltwick (NZ9110) on 3 July 1924 (Snowdon, 1925), representing the eleventh Yorkshire record since 1833 (Chislett, *l.c.*). This bird, weighing 2lb 14oz. (1304gm), was acquired by the Whitby Literary and Philosophical Society to be mounted for the local collection at Whitby Museum.

Honey-buzzard *Pernis apivorus*

A cased specimen (WHITM:ORN95) preserved by the Middlesbrough taxidermist Mr George Mussell is exhibited in the main wall displays. Inside the case is a very fine example of the taxidermist's label; the name and address of the taxidermist are printed in the margin between two concentric circles. The inner circle encloses an iconic outline sketch of a drifter's stern sail across which are hand printed the specimen data stating "shot by W.H.Raw of Littlebeck 19 September 1890". This record would appear to be additional to the published literature. No donor or additional accession data can be traced for this specimen (Denise Gildroy *pers. com.* 21.07.2016).

Red Kite *Milvus milvus*

Thomas Nelson (*l.c.*) knew of only fifteen Yorkshire occurrences for the 19th century, referring to it as "a casual visitant of very rare occurrence". Of Whitby district examples, a specimen in the Yorkshire Museum was, according to its taxidermy label, shot near Guisborough (NZ61) some time between 1859 and 1864 (Mather, 1986) and, in a manuscript supplied to Thomas Nelson in 1880, J. Tennant wrote that one was shot from the nest at Murton near Hawnby (SE5388) by Charles Harrison, who obtained both birds (Mather, 1986).

The Red Kite in Whitby Museum, which came into the collection in 1974 (WHITM:ORN121) has the non-committal label "Found dead, North York Moors" and could possibly be the specimen recorded by Mather (1986) as being present in Farndale during June 1973. No donor or additional accession data can be traced for this specimen (Denise Gildroy *pers. com.* 12.05.2016).

Marsh Harrier *Circus aeruginosus*

A summer visitor which was widespread in lowland and wetland landscapes of Yorkshire during the 18th century. The drainage of wetlands and systematic persecution by game interests rendered it extinct as a breeding species during the 19th century, Thomas Nelson (*l.c.*) referring to it as a "casual visitant of very rare occurrence".

After the return of a breeding population to the Norfolk Broads from 1915, birds began to occur as rare summer visitors to Yorkshire. Locally F. Snowdon reported an immature bird trapped on

Fylingdale Moor (NZ90) 10 May 1926 (Chislett, *l.c.*), this representing only the fourth post-19th century Yorkshire record (Wilson & Slack, *loc. cit.*). Breeding re-commenced in Yorkshire in 1963 and by the 1980s lone birds could be encountered during spring and autumn migration almost anywhere in the county (Mather, 1986).

The Fylingdale specimen (WHITM:ORN92) was set up and cased by the celebrated taxidermy firm of Rowland Ward (61 Piccadilly, London) and donated to Whitby Museum by John H. Harrowing (Denise Gildroy *pers. com*. 12.05.2016). Two 'Ivorine' labels, a small circular example embossed with the Rowland Ward insignia and one rectangular, with the words "Fylingdales Moor May 1926" are present inside the case. This represents one of the finest examples of the art of taxidermy in the Whitby collections.

Hen Harrier *Circus cyaneus*

Two specimens with the accession number WHITM:ORN93 are displayed in one of the free-standing J.H. Wilson cases; one dated 1873 from a Mr M. Lister may, according to Nelson (*l.c.*) have been formerly in the possession of Wm. Lister and procured on Egton Moor (NZ8208) by a Mr Bennison, the second from an unknown donor was from Rigg Mill, Stainsacre (NZ9007) 16 October 1903 (Denise Gildroy *pers. com*. 21.07.2016). A third, unaccessioned display specimen was, according to its label "Shot at Ugthorpe [NZ7810] December 1934". It had been set up [mounted] by S.E. Cook, the Zoological Preparator at the Hancock Museum, Newcastle, and presented by Philip Smales.

Stone-curlew *Burhinus oedicnemus*

The crepuscular Stone-curlew was formerly a common summer visitor to the East Yorkshire Wolds and on rough tracts of heath and warren elsewhere in the county. The enclosure of common land, particularly on the Wolds during the 18th and 19th centuries and persecution by hunters and egg collectors rendered it virtually extinct as a breeding bird in Yorkshire by 1874 (Wilson & Slack, *l.c.*). Its former status and rapid decline was documented at length by Thomas Nelson (*l.c.*), though odd pairs sporadically bred until 1937 (Mather, 1986).

Of post 1930s migrants, A.B. Walker reported one shot but alive on the shore at Sandsend (NZ8612) on 22 August 1951, which sadly died during the same night (Chislett, 1952; Mather, 1986). The specimen (WHITM:ORN51) displayed in case 59 was, according to accession documentation, preserved and set up by S.E. Cook at the Hancock Museum (Denise Gildroy *pers. com*. 12.05.2016). Another was reported locally by J. Webb at Hawsker (NZ9207) 28 July 1978 (Wilson & Slack, 1996).

Collared Pratincole *Glareola pratincola*

One killed by William Wilson between Ruswarp and Whitby (NZ8909) on 19 October 1871 was acquired by Whitby Museum (Clarke & Roebuck, 1881; Nelson, *l.c.*; Chislett, *l.c.*). On dissection it was found to be a male and its stomach to contain ants and a few feathers (Mather, 1986). Up to 1996 this represented only the third of ten Yorkshire records (Wilson & Slack, *l.c.*). The specimen had no accession data and is no longer in the collection (Denise Gildroy *pers. com*. 12.05.2016).

Black Tern *Chlidonias niger*

A specimen initially mis-reported as a Sooty Tern was shot at Whitby during September 1870 and reported as "now in Whitby Museum" (Stephenson MS in Clarke & Roebuck, 1881). Its identity

was amended to Black Tern in Clarke & Roebuck (1883). No accession records have been traced and the specimen is no longer in the collection (Denise Gildroy *pers. com*. 21.07.2016).

Ivory Gull *Pagophila eburnea*

Abnormally plumaged gulls such as albino or leucistic individuals are not unusual and have in the past been claimed as possible Ivory Gulls. One such uncorroborated sighting claimed at Whitby by J. Kitching was reported to Thomas Nelson (*l.c.*) by T. Stephenson.

On 2 March 1925 a specimen occurred in Whitby harbour (NZ8911), where it remained for the next five days and was seen by A.S. Frank, F. Snowdon, the local taxidermist , J.H. Wilson and the celebrated photographer Frank Meadow Sutcliffe (Snowdon, 1925). When first seen it appeared to be suffering an injury. Food thrown down for it was eagerly seized and several times it flew to the pier where it was seen to carry away an angler's bait (Snowdon, *l.c.*).

Typical of so many high arctic species, the bird was extraordinarily tame and on 7 March was captured by a young fisherman. Sadly the bird soon died, its body acquired by the Whitby Literary and Philosophical Society for 15/- and passed to J.H. Wilson for preservation (WHITM:ORN122). Its plumage markings showed it to be a first winter bird and during dissection it was found to be a male. Its body was emaciated, weighing 16½ ounces (513gm) and lodged in its gullet was a corroded haddock hook which no doubt accounted for the bird's sickly condition (Snowdon, *l.c.*).

While still frequenting the harbour area, the specimen was photographed on the parapet of the West Pier. A copy of the photograph (below) with copyright ascribed to F.M. Sutcliffe was published in Snowdon's article in *The Naturalist* and an enlarged print currently accompanies the mounted gull in Whitby Museum.

Copyright] Ivory Gull. [F. M. Sutcliffe, Skelgate.

Pallas's Sandgrouse *Syrrhaptes paradoxus*

During the 19th century, Europe was visited on several occasions by huge invasions of this central Asian bird, with large numbers reaching Britain. During the 1863 invasion at least 80 birds were recorded in Yorkshire; in 1876 three birds were present at Teesmouth in late August but in May 1888 a massive invasion brought an estimated 845 birds, at least two pairs remaining to breed (Nelson, *l.c.*; Chislett, *l.c.*; Mather, 1986; Dymond *et al.,* 1989). Mather calculated that the 1888 invasion brought 230-250 birds to the North Riding, of which 25 were killed. In addition small flocks, presumably remnants from earlier invasions, were present in Yorkshire in 1890, 1891 and 1899 (Mather, 1986).

In one of the upright free-standing J.H. Wilson cases are two specimens of Pallas's Sandgrouse. Apart from being named, no date or locality is given for these birds although the following text which appears on an 'Ivorine' label on the case exterior suggests a local provenance, "Many of the

local birds shown here were set up and cased by Mr.J.H.Wilson of Whitby". Since sandgrouse from the 1888 Yorkshire invasion are in the Dorman Museum, Middlesbrough (T. Nelson colln.) and the Yorkshire Museum (J. Backhouse colln.), it seemed likely that both the Whitby specimens would be from the same invasion. This, however, was not the case, Stephenson (1888a) noting "it is exactly a quarter of a century [May 1863] since the specimen in our local museum was shot in company with three others, feeding on recently-sown barley at Newholm [NZ8610] near Whitby". The 1863 invasion was the earliest recorded which William Eagle Clarke concluded involved eighty birds reaching Yorkshire (Clarke & Roebuck 1881) of which 28 were "procured" (Nelson, *l.c.*). Of the second bird in the Wilson case, Stephenson (1888a) notes "On 28 May [1888], two (a male and a female) were shot out of a flock of about twenty at Carr Hill near Whitby [NZ8709] while feeding on clover. The female, which I saw in the flesh, has been preserved by Mr J.H.Wilson … who found the crop full of clover". A specimen, presumably the latter, is listed in the *Whitby Literary and Philosophical Society Annual Report for 1888* as being donated by J.J. Chapman (WHITM:ORN103) (Denise Gildroy *pers. com*. 12.05.2016). The final reference to sandgrouse in the Whitby region is in Stephenson (1888b) when six sandgrouse from a flock of eighty were shot on the ridges between Stonegate and Lealholm Bridge (NZ7608) during the latter part of June 1888.

Scops Owl *Otus scops*

By 1986 there had only been eighty British records of this diminutive owl, most dating from the 19th century (Mather, 1986). Although there are eleven claimed records for Yorkshire, some were insufficiently documented to prove authenticity. However, one shot at Egton Bridge (NZ8005) in 1865 (Stephenson MS in Clarke & Roebuck, 1881) is regarded as the seventh and last Yorkshire record. This Scops Owl (WHITM:ORN84) is without associated accession data (Denise Gildroy *pers. com*. 12.05.2016), though its presence with other British owls in one of the J.H. Wilson cases suggests its local provenance, circumstantially linking it with the Egton Bridge record.

Tengmalm's Owl *Aegolius funerius*

This was formerly a regular vagrant to the British Isles with 50 records before 1958 but only eight since. All but one of the twelve Yorkshire records are from the 19th century (Wilson & Slack, *l.c.*). The first Yorkshire occurrence was one from Sleights Moor (NZ8504) in about 1840. It was prepared for Whitby Museum but having been imperfectly cured, it was said to have "decayed" (Stephenson MS in Clarke & Roebuck, 1881; Clarke, 1882). The fifth Yorkshire record had been obtained at Egton (NZ8006) 19 November 1872 (Clarke & Roebuck, 1881; Clarke, *loc. cit.*). It was in the possession of W. Lister of Glaisdale but was eventually acquired by Whitby Museum (Mather, 1986).

The seventh Yorkshire record was one shot on 30 December 1880 at Normanby near Hawsker (NZ9206) by some rabbit shooters whose dog flushed the bird from a Broom *Cytisus scoparius* covert. The specimen was sent by J.H. Wilson to W. Eagle Clarke for verification (Clarke & Roebuck, 1881; Clarke, *loc. cit.*). Sadly no information on either the Egton or Hawsker specimens has been traced in the accession documentation (Denise Gildroy *pers. com*. 12.05.2016). However, a Tengmalm's Owl (WHITM:ORN83) displayed in one of the J.H. Wilson cases suggests this may be the Hawsker specimen which eventually came into Wilson's possession.

Wryneck *Jynx torquilla*

Nelson (*l.c.*) referred to Whitby Museum possessing a local specimen. One has been accessioned (WHITM:ORN124) though it lacks any associated information (Denise Gildroy *pers. com*. 21.07.2016) and is no longer on display.

Shore Lark *Alauda alpestris*
On 20 March 1872 Martin Simpson of the Whitby Museum wrote in *The Zoologist* "You may feel interested that we have obtained a Shore Lark *Alauda alpestris*, which was shot on the beach near Whitby by our indefatigable friend Mr George Kitching" (Simpson, 1872). No accession records have been traced and the specimen is no longer in the collection (Denise Gildroy *pers. comm*. 21.07.2016).

White's Thrush *Zoothera dauma*
Most of the 34 authenticated British records have appeared in east coast districts from Shetland to Suffolk, of which five were in Yorkshire (Sharrock & Sharrock, 1976; Mather, 1986). Omitting two un-provable anecdotal records from Huddersfield in 1864 and Danby-in-Cleveland in spring 1870, the first authenticated Yorkshire occurrence was from Whitby and dates from 20 November 1878, the specimen being acquired by Whitby Museum.

"It had killed itself by coming in contact with a telegraph wire and had displaced and injured several of the neck feathers, but was otherwise in good condition. It has been preserved for the museum here and forms an interesting addition to our collection of county birds" (Simpson, 1880). The specimen (WHITM:ORN111) is currently displayed with other passerines in one of the J.H. Wilson cases of local birds.

Northern Crested Tit *Parus cristatus cristatus*
The Crested Tit is a classically sedentary bird, individuals confining themselves to within the few hectares of their own breeding territories. This phenomenon, through prolonged isolation, has resulted in the creation of six recognised sub-species across the Western Palaearctic region. The only UK representative is *P. c. scoticus* (Prazák, 1897) centred in the Cairngorms. The nominate form, *P. c. cristatus* Linneaus, 1758, is northern European, extending from Fenno-Scandia east to the Urals and south to Rumania and the Ukraine. *P.c. mitratus* C.L. Brehm, 1831 occurs in Western and central Europe from Denmark, through France to the Pyrenees and the Alps and east to Serbia. In each case, unless driven by extreme storms, it is highly unusual for specimens to occur away from their home ranges.

On 20 March 1872 Martin Simpson, Whitby Museum's honorary natural history curator, briefly described the acquisition by George Kitching of a Crested Tit [no scientific name], which he got in a ravine six miles from Whitby (Simpson, 1872). Thomas Stephenson, in a manuscript sent to William Eagle Clarke, wrote that the specimen in the local collection at the Whitby Museum had been obtained on the Newton House estate (NZ8803), which abounds with Larch plantations (Clarke & Roebuck, 1881).

This specimen must at some stage have received critical examination from a national expert since it is included in the authoritative *Handbook of British Birds* (Witherby *et al.,* 1938) as the first and only example of the nominate Northern Crested Tit *P. cristatus cristatus* in the British Isles.

Other examples of Crested Tits have been claimed for Yorkshire e.g. from Thorne, Thirsk, Bradford and Keighley at various dates from 1797 to 1887. These have been assessed by John R. Mather (1986) and dismissed through insufficient (or indeed any) supporting evidence. Several Crested Tits (*sensu lato*), about ten up to 1986, had been recorded in England mostly in southern and eastern counties and it is likely that all are attributable to one or other of the continental subspecies of *cristatus* or *mitratus,* both of which have now been confirmed here (Lack, 1986).

Though no longer in the museum collections (Denise Gildroy *pers. com*. 12.05.2016), if the Whitby specimen still survives it would be of supreme importance to Yorkshire and British ornithology and a tissue sample would corroborate its sub-specific status through DNA analysis.

Lesser Grey Shrike *Lanius minor*
A specimen shot at Sleights (NZ8607) on the 20th September 1905 was forwarded by Thomas Stephenson to Mr. W. Eagle Clarke for identification, who pronounced it to be an immature bird in its first plumage and a most interesting addition to the avifauna of the county and the north of England (Stephenson, 1906; Nelson, *l.c.*), Mather (1986) calculating it to be the ninth British record. Though Stephenson donated the specimen to Whitby museum, no accession data survives and sadly it no longer exists in the collection (Denise Gildroy *pers. com*. 21.07.2016).

Pine Grosbeak *Pinicola enucleator*
The museum at Whitby contains a specimen of this rare Arctic visitor, shot from a flock at Littlebeck [NZ8804], four miles distant from Whitby, in the winter of (about) 1861 [Mather (1986) quotes 1896] by G. Kitching, who at the same time procured four others; these were prepared as skins but have been lost sight of. At the request of Mr. J. H. Gurney, Messrs Stephenson and Wilson of Whitby compared the Whitby Museum example with a Swedish skin sent by Mr. Gurney and, writing on I3th February 1890, Stephenson pronounced the two to be the same species, though in different plumages (Nelson *l.c.*). The Littlebeck specimen, deemed to be the only authenticated Yorkshire record (Mather, 1986), is sadly no longer in the collection and no accession details have been traced (Denise Gildroy *pers. com*. 21.07.2016).

Lapland Bunting *Calcarius lapponicus*
One was caught by J. Kitching in Ruswarp Fields about a mile from Whitby in the spring of 1870 or thereabouts and is now in the Whitby Museum (T. Stephenson MS. in Nelson, *l.c.*). This represents the earliest Yorkshire record (Wilson & Slack, *l.c.*). No accession records have been traced and the specimen is no longer in the collection (Denise Gildroy *pers. com*. 21.07.2016).

Cirl Bunting *Emberiza cirlus*
Of three present at Fen Bog, Whitby (SE8597) on 28 February 1882, a female was shot which was in Whitby Museum (Stephenson MS in Clarke & Roebuck, 1883; Nelson, *l.c.*). No accession records have been traced and the specimen is no longer in the collection (Denise Gildroy *pers. com*. 21.07.2016). On 10 January 1918 one was present on Upgang Road, Whitby (NZ8711) (Sewell, 1918).

Little Bunting *Emberiza pusilla*
A male was captured out of a flock of Linnets and other small birds at Airy Hill Farm near Whitby on 6 October 1913. It was identified by W. Eagle Clarke and judged to be an addition to the county avifauna (Stephenson, 1913; Chislett, *l.c.*). A specimen, presumably the aforementioned (WHITM:ORN116), is displayed with other passerines though without accompanying data in one of the J.H. Wilson cases of local birds.

Summary
Seventeen specimens which are, or have been, in the Whitby collection represent the first to the eleventh Yorkshire records (see table 3) and include one new to the North of England and one new to Britain.

The Whitby collection also contains local and national examples of the art and craft of taxidermy, including the work of such named practitioners as S.E. Cook (Newcastle), J. Kitching (Whitby), George Mussell (Middlesbrough), Graham Teesdale (Rotherham), Rowland Ward (Piccadilly, London) and J.H. Wilson (Whitby). Taxidermy is increasingly becoming a subject of historical research (see Marshall, 2007 & 2009; Morris, 2010) and, in addition to their biological significance, specimens are increasingly appreciated as art objects (see exhibition at Scarborough Art Gallery summer 2016).

Table 3: Yorkshire occurrence status of Whitby Museum bird specimens

Occurrence Status	**Number**
1st Yorks. record	7
3rd Yorks. record	3
4th Yorks. record	1
5th Yorks. record	2
7th Yorks. record	2
10th Yorks. record	1

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YNU Bryological Section: Report for 2015

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Excursions

Two sectional meetings were held in 2015 and are reported below. In addition, the opportunity is taken to include a report from the YNU Excursion to Ravenseat, Upper Swaledale, on 8 August 2015. The bryophyte section of this report was omitted from the published account in *The Naturalist* No. 1090. Nomenclature follows the current British Checklist and Census Catalogue (Hill *et al.*, 2008).

Settlebeck Gill, Sedbergh (VC65) 9 May 2015

Most bryophyte records from the Howgill Fells are concentrated around the hotspots of Cautley Spout and Black Force. For our spring meeting we opted for a different venue, Settlebeck Gill, which cuts into the Howgills to the north of Sedbergh. We started out along Thorns Lane near Settlebeck Bridge, where we were able to record a number of common bryophytes from waysides and walls. Almost immediately *Syntrichia papillosa* turned up on a willow, a moss not recorded in VC65 since the end of the 19th century. Another epiphyte there was *Zygodon conoideus*, bearing abundant capsules. Old walls produced a number of species not seen subsequently in the Gill, including *Syntrichia intermedia* and *Homalia trichomanoides*. From Thorns Lane we crossed a field to reach a wooded part of the lower Gill. A side stream cutting through the field had *Fissidens celticus* on soil on its banks, a western moss which has very few Yorkshire records. The vicinity of the stream banks in the lower Gill were difficult to explore because of overnight rain but there were some fine patches of *Porella cordaeana* in one place, and *Rhynchostegiella teneriffae* was also present on wet stones near the stream. The tally of epiphytes increased with *Microlejeunea ulicina*, *Metzgeria violacea* and *Cryphaea heteromalla*.

North of Castleshaw Farm the gill passes through pastures but there is a strip of open woodland along the banks. A mixture of acid and somewhat base-rich habitats provided a good mix of bryophytes. Ground-dwelling mosses included *Cirriphyllum piliferum* and *Rhytidiadelphus loreus*, while both *Isothecium myosuroides* and *I. alopecuroides* were present on tree trunks and bases. Calciphiles on wet rocks and banks included *Gymnostomum aeruginosum* and *Tortella tortuosa*. Epiphytes continued to provide interest, notably with the discovery of *Ulota calvescens* on Hazel, a new vice-county record. A few years ago this would have been considered an astonishing occurrence but in 2013 *U. calvescens*, which was previously thought to have a hyper-oceanic distribution, was found to be widespread in the South Pennines. On the same Hazel tree there was a fine population of *Orthotrichum stramineum*, allowing comparison with *O. affine* and O. *pulchellum* growing nearby. *Orthotrichum lyellii* was also recorded in the same area.

Where the gill cuts into the steep slopes of the Howgills the ground is more open and the slopes have scattered rock outcrops and some seepages and flushes. *Frullania tamarisci*,

Ptilidium ciliare, *Racomitrium ericoides* and *Sanionia uncinata* grew in thin turf and there were some very fine patches of *Breutelia chrysocoma*. Several calcifuges occurred on the rocks, with plentiful *Ptychomitrium polyphyllum* and small amounts of *Andreaea rothii* and *Campylopus atrovirens*. Sometimes these grew quite close to more calciphile bryophytes such as *Tortella tortuosa* and *Ctenidium molluscum*. *Tritomaria quinquedentata* was also present, while *Amphidium mougeotii* and *Preissia quadrata* were on wetter rocks. Species growing on peaty soil included *Entosthodon obtusus* and (in small quantity) *Lophozia incisa* and sterile *Diphyscium foliosum*. The seepages and flushes were often slightly base-enriched and produced *Campylium stellatum*, *Palustriella falcata*, *Scorpidium cossonii* and *S. revolvens*.

By late afternoon we had worked the gill as far as SD660932. The climb out of the gill and the adjacent moorland produced some common *Sphagna* as well as *Pohlia flexuosa* on soil at the edge of a slump.

The variety of habitats and the mixture of acidic and base-rich substrates resulted in a very impressive total of 151 species along a linear route of little more than 1 km, mostly in tetrad SD69R.

Roulston Scar (VC62) 10 October 2015

Our autumn meeting started from the car park below the White Horse above Kilburn. An Ash tree by the car park produced *Syntrichia papillosa*, a moss not recorded in VC62 since the end of the 19th century. It is a curious coincidence that this is the third consecutive Sectional meeting in which *S. papillosa* has been restored to the respective vice-county. Unlike many of our other epiphytes it has been slow to recover lost ground after reductions in SO_2 pollution. *Orthotrichum lyellii* was on the same tree. Our route took us from the car park through the woodland along the south-western slopes of the Roulston Scar bluff. An early find was *Plagiothecium latebricola* on the side of an old log. Although very scarce and dependent on decaying vegetation, which is a changeable and impermanent habitat, *P. latebricola* has been known from Roulston since 1902 and has presumably had a constant presence there. The ground flora included characteristic woodland mosses such as *Cirriphyllum piliferum*, *Eurhynchium striatum* and *Thuidium tamariscinum*. The most productive habitat was provided by moderately calcareous boulders and stones on the wooded slopes. *Taxiphyllum wissgrillii* was found in several places on rocks and stones, characteristically near ground level. Some southern bryophytes benefit from the warm, south-western aspect of the slopes, notably *Tortula marginata*, *Fissidens gracilifolius* and *Rhynchostegiella tenella*. Other calcicoles included *Porella platyphylla*, *Anomodon viticulosus*, *Cirriphyllum crassinervium*, *Ctenidium molluscum* (sparsely), *Neckera complanata* and *N. crispa*. *Seligeria recurvata* was also present. One bouldery spot was particularly good for *Plagiomnium* species, with some fine *P. cuspidatum* as well as *P. affine*, *P. rostratum* and the common *P. undulatum*. There were several colonies of *Mnium stellare*, usually on humus-covered rocks and ledges. *Plagiochila porelloides* was frequent. Epiphytes included *Metzgeria violacea* and *Zygodon conoideus*.

We ascended to the base of Roulston Scar at its western end. Although the ground at the base of the scar is open, the steep slopes and rank vegetation made progress difficult and the

ground was not very productive for bryophytes. Back down in the woods, the cooler and moister habitats on the north-facing slopes led to subtle differences in the flora. Mosses such as *Plagiothecium undulatum* were more frequent on the acid humus and there were some common calcifuges such as *Diplophyllum albicans*. *Plagiochila asplenioides* and *Frullania tamarisci* were present, the latter on a shaded boulder, and *Orthotrichum stramineum* was found on a sallow. The bridleway in the woods below and to the west of the bluff produced some common ruderals. A dense form of *Oxyrrhynchium pumilum* covered a small stone in this area. The total number of species recorded on the day was 89, all in tetrad SE58A.

Ravenseat and Whitsun Dale, YNU Excursion (VC65) 8 August 2015

The bryologists worked the banks of the Whitsun Beck south from Ravenseat as far as the How Edge gorge. The rocks in the bed of the stream were acidic, supporting an abundance of *Racomitrium aciculare*, *Hygrohypnum ochraceum*, occasional *Fontinalis antipyretica* var. *gracilis* and, on the banks, *Hyocomium armoricum*. Near Ravenseat flushed areas on the grassy banks had some bryophytes typical of base-poor mires, including *Straminergon stramineum* and *Warnstorfia exannulata*. An early find was one of the highlights of the day, *Blasia pusilla*, a distinctive but very scarce liverwort that has an association with the alga *Nostoc*, which forms colonies in the liverwort thallus. There were several patches on damp bare soil on the stream banks. Another notable one, typically on soil over rock by the stream, was the leafy liverwort *Scapania subalpina*, an upland liverwort here near the south-eastern edge of its British distribution. At various points along the stream bank there were vertical crags of wet sandstone with, in places, strong flushing by base-rich water. Consequently the flora included not only calcifuges such as *Bartramia pomiformis* and *Seligeria recurvata* but calcicoles such as *Plagiobryum zieri* that, in the Dales, are more characteristic of limestone outcrops. *Amphidium mougeotii* and *Blindia acuta* were frequent: these tend to occupy mildly acid to weakly base-rich habitats but avoid highly calcareous strata. Among the many other species on the crags were *Gymnostomum aeruginosum* and *Hymenostylium recurvirostrum* (both with capsules), *Jungermannia atrovirens*, *Palustriella commutata*, *Preissia quadrata* and *Solenostoma obovatum*. Several species of *Sphagnum* were present on the wet banks, including *S. girgensohnii*, *S. russowii* and *S. teres*. *Sanionia uncinata* occurred as an epiphyte on sallows. A slump on steep banks near the entrance to How Edge Gorge produced another highlight, the distinctive moss *Discelium nudum*, its minute shoots developing against a background of green protonema. At this season of the year the spore capsules had not yet developed, but the orange male buds were conspicuous. *Discelium* is very scarce and its British distribution is concentrated in the Pennines. The steep banks of the gorge added further species. Shaded ledges and banks under tree-cover had *Dicranum majus* and *Rhytidiadelphus loreus*, and *Lejeunea cavifolia* was on a rock face. One part of the east bank has a large expanse of open, base-rich seepage, sometimes forming tufa. Additions here included *Ditrichum gracile*, *Leiocolea alpestris*, *Orthothecium intricatum*, *Philonotis calcarea*, and a number of more common calcicoles. The total number of species recorded (along a linear route of only 1 km) was 115.

The year's records

The number of records received for 2015 from each of the Watsonian vice-counties is shown below.

Vice-county	Records received
61	1
62	92
63	5
64	1967
65	795

The bulk of records in 2015 came from the Yorkshire Dales, especially from Nick Gaunt's recording in Nidderdale and Gordon Haycock's in Wharfedale. There were four new vice-county records (*Fossombronia incurva* VC64, *Lophocolea semiteres* VC62, *Plagiochila bifaria* and *Ulota calvescens* VC65), and five vice-county updates, i.e. first post-1960 records (*Hygrobiella laxifolia* VC65, *Syntrichia papillosa* VC62 and VC65, *Neckera pumila* VC65 and *Drepanocladus polygamus* VC62).

A visit to the High Batts Reserve by the River Ure north of Ripon early in 2015 produced several interesting records. A gravelly calcareous scrape had some bryophytes that have become very scarce in lowland habitats, notably *Ditrichum gracile*, *Thuidium assimile* and *Entodon concinnus*. The scrape is effectively a remnant of thin calcareous turf and shows the value of creative management in what is otherwise largely a woodland reserve.

The Buttertubs area in Upper Swaledale was visited during the summer. *Hygrobiella laxifolia* was found on Long Scar, surprisingly the first record for VC65 since 1956. *H. laxifolia* is distinctive but minute and often difficult to detect when growing, as it often does, in a film of water on a rock face. Another of Yorkshire's rare liverworts, *Scapania subalpina,* was found nearby on the banks of Lover Gill. It is known only from a few sites in the north-west of the county.

Cautley Crag is a famous bryological site that was visited by the British Bryological Society in 1969 but has been little recorded since. A brief visit in May 2015 confirmed that several notable bryophytes are still present, including *Amphidium lapponicum*, *Bryum weigelii*, *Entosthodon obtusus* and *Frullania fragilifolia*. The liverwort *Plagiochila bifaria* was found new to VC65, though in the 1960s this species had not clearly been distinguished from *P. spinulosa*. It has an oceanic distribution and is known elsewhere in Yorkshire only from a collection at Ingleton in 1966.

A visit to the Bowland Forest (VC64, now in Lancashire but formerly the West Riding) with the North-Western Naturalists' Union produced some good records in the Langden Beck area. One of the tracks at the entrance to the moorland had some quite rich communities on moist acidic soil at its edges, supporting *Fossombronia incurva*, *Scapania irrigua*, *Archidium alternifolium* and *Pohlia drummondii*. This is an interesting habitat that merits greater scrutiny. There are very few rock outcrops along the Langden Beck, and therefore limited diversity of habitat, but *Anastrophyllum minutum* was a notable record there.

We now expect to find rich epiphytic communities on our trees, but some bryophytes have been slow to recover lost ground. *Syntrichia papillosa* is one of these, in spite of its

production of abundant gemmae (vegetative propagules). However, the two new records from the Sedbergh and Kilburn meetings (described above) mean that it is now missing only from VC63 in Yorkshire, and it is surely waiting to be found there. *Neckera pumila* has not yet been found in the south and east of Yorkshire, although there have been new records in some adjacent counties. A record last year from the north-western edge of VC65, in the Lune Valley, appears to be the first in the vice-county since the 1950s but this moss may well have had a continuous presence in that area. Its British distribution has a southern and western tendency. There were two further records of *Ulota calvescens* in 2015. Its presence was completely unforeseen when it was first found in the Pennines in 2013, but it is clearly widespread in the west of the county.

Drepanocladus polygamus is a scarce moss of moist turf and marsh in calcareous and saline habitats and its distribution has a coastal tendency. Stuart Hedley's record from the coast at Redcar is the first in Yorkshire since the 1920s.

The list below provides details of these and other records of note, including new vice-county records and updates to the Census Catalogue (identified by an asterisk). The vice-county is given in brackets before each individual record.

Amphidium lapponicum: (65) SD680965 crevices in north-facing crag, Cautley Crag, T.L. Blockeel, 8 May 2015. A montane moss with no other recent records from VC 65 but with old records from Blands Gill in the Howgills and Cronkley Scars in Teesdale.
Anastrophyllum minutum: (64) SD61875064 on face of gritstone rock on low crag, Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015. There are few records of this upland calcifuge in Yorkshire.
Anomobryum concinnatum: (65) NY8342728633 on basic rock exposures, Cronkley Scar, A. McLay, 25 November 2015. This inconspicuous moss was widely recorded in the vice-county in the 19th century but was last reported in 1967.
Archidium alternifolium: (64) SD627509 moist bare soil at edge of track, Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015.
Bazzania trilobata: (64) SD6150 very small patch on peaty soil on gritstone crag, Holdren Castle, Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015.
Bryum gemmiferum: (64) SE35155463 Plumpton Rocks area, P.N. Gaunt, 10 November 2015. An inconspicuous moss that is probably under-recorded.
Bryum moravicum: (65) SE3076 & SE2976 on Hawthorn and other trees, High Batts near North Stainley, T.L. Blockeel, 8 January 2015. This normally epiphytic moss, formerly known as *B. flaccidum* and *B. laevifilum*, has become less common in recent years. It is possible that it benefited from reduced competition when levels of SO_2 pollution were high.
Bryum pallescens: (64) SE01907128 Conistone Moor, G. Haycock, 29 December 2015.
Bryum weigelii: (65) SD67289648 high-level flush, Red Gill, Cautley, T.L. Blockeel, 8 May 2015. This highly distinctive moss forms salmon-pink carpets in upland flushes. It has very few localities south of the Scottish mountains but is still plentiful at this known site above Cautley in the Howgills.
Cololejeunea minutissima: (64) SD631511 one small patch on Sycamore, Langden Brook near Sykes, Forest of Bowland, T.L. Blockeel, 15 August 2015. The recent spread of this minute but distinctive epiphyte has been noted in previous years' reports. This is the third record for the vice-county.

Conocephalum salebrosum: (65) SD8796 Lover Gill and vicinity near Buttertubs, Upper Swaledale, T.L. Blockeel, S. Knight & L. Knight, 7 August 2015; (65) SD6897 Cautley Spout, T.L. Blockeel, 8 May 2015. This segregate from the well-known Great Scented Liverwort *C. conicum*, remains under-recorded but is not always easy to identify.

***Didymodon acutus* s.lat.**: (64) SE09907617 on roadside tarmac, Goydon Pot area, T.L. Blockeel, P.N. Gaunt *et al.*, 24 November 2015. As noted in previous reports, *D. acutus* belongs to a difficult species complex that is not clearly understood at present and also includes *D. icmadophilus*. The increase of records from ruderal habitats has been remarkable; it was formerly known primarily as a colonist of open ground in natural and semi-natural habitats on chalk and limestone.

Discelium nudum: (64) SD6150 Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015. This distinctive moss, almost confined to the Pennines in Britain, has been under-recorded in recent years but its status is unlikely to have changed significantly.

Ditrichum gracile: (65) SE29967666 gravelly calcareous ground in scrape, High Batts near North Stainley, T.L. Blockeel, 8 January 2015.

Drepanocladus polygamus: (62*) NZ57592554 slack derived from upper saltmarsh, Redcar dunes, S. Hedley, 21 August 2015.

Entodon concinnus: (65) SE29967666 gravelly calcareous ground in scrape, High Batts, near North Stainley, T.L. Blockeel, 8 January 2015; (65) NY8501 Birkdale Tarn, R.H. Carter & S. Knight, 23 July 2015. This calcicole often occurs on ground that has been previously disturbed but its means of spread is not obvious as it rarely produces capsules and has no obvious vegetative propagules.

Entosthodon obtusus: (65) SD680975 earth on rock ledge, Cautley Spout, T.L. Blockeel, 8 May 2015.

Fissidens rufulus: (64) SE34685671 Natural rock, Calcutt, P.N. Gaunt, 14 May 2015.

Fossombronia incurva: (64*) SD62685090 moist bare soil at edge of track with *Scapania irrigua*, Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015. This is the third Yorkshire site for this small liverwort, which is a colonist of bare but moist and relatively stable acid soil.

Fossombronia wondraczekii: (64) SE22065985 Soil, Swarcliffe, P.N. Gaunt, 29 July 2015.

Frullania fragilifolia: (65) SD6897 Cautley Spout, T.L. Blockeel, 8 May 2015. This liverwort has an oceanic distribution in Britain and is known in Yorkshire only from the Ingleton area, the Howgills and Upper Swaledale.

Hygroamblystegium varium: (64) SD91677905 Strans Gill, P.N. Gaunt & G. Haycock, 25 June 2015.

Hygrobiella laxifolia: (65*) SD87719591 in film of water on wet gritstone crag, Long Scar near Buttertubs, Upper Swaledale, T.L. Blockeel, S. Knight and L. Knight, 7 August 2015. Mostly an upland liverwort in Britain, and probably under-recorded in Yorkshire .

Isopterygiopsis pulchella: (65) SD8795 creeping through *Amphidium mougeotii*, Long Scar near Buttertubs, Upper Swaledale, T.L. Blockeel, S. Knight and L. Knight, 7 August 2015. A scarce moss of moist rock ledges in the uplands, often found with *A. mougeotii*.

Lophocolea semiteres: (62*) SE46659369 base of pine near car park, Silton Forest, 23 April 2013, J.D. Shanklin. An introduced liverwort which is gradually extending its range and frequency.

Metzgeria consanguinea: (61) SE70863557 Bubwith, Lower Derwent Valley, P.N. Gaunt, 3 January 2015. An epiphyte, rarer than the similar *M. violacea*, and tending to grow on more acid bark.

Neckera pumila: (65*) SD63209233 on trunk of Sycamore, east bank of R. Lune, Lincoln's Inn Bridge near Sedbergh, T.L. Blockeel, 9 May 2015.

Orthothecium intricatum: (65) SD8796 Lover Gill and vicinity near Buttertubs, Upper Swaledale, T.L. Blockeel, S. Knight and L. Knight, 7 August 2015; (65) SD6897 Cautley Spout, T.L. Blockeel, 8 May 2015. The typical habitat of this moss is in moist crevices and recesses on rocks that are at

least mildly base-rich.

Plagiochila bifaria: (65*) SD682975 rock face in ravine below waterfall, Cautley Spout, T.L. Blockeel, 8 May 2015. An oceanic liverwort otherwise known in Yorkshire only from Ingleton.

Plagiochila britannica: (64) SE33035832 Nidd Gorge, P.N. Gaunt, 9 April 2015. A liverwort that is probably under-recorded because of its similarity to *P. porelloides*.

Pohlia drummondii: (64) SD6250 moist bare soil at edge of track, Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015.

Pterogonium gracile: (65) SD631921 tree boles, east bank of R. Lune, Lincoln's Inn Bridge, near Sedbergh, T.L. Blockeel, 9 May 2015. In Yorkshire this distinctive moss is confined to a few sites in the north-west.

Racomitrium sudeticum: (65) SD6797 Red Gill, Cautley, T.L. Blockeel, 8 May 2015. A segregate of the *Racomitrium heterostichum* group that is still under-recorded.

Scapania irrigua: (64) SD6250 moist bare soil at edge of track, Langden Brook, Forest of Bowland, T.L. Blockeel and North-Western Naturalists' Union, 15 August 2015.

Scapania subalpina: (65) SD87999629 in damp turf on bank of gill, Lover Gill and vicinity near Buttertubs, Upper Swaledale, T.L. Blockeel, S. Knight and L. Knight, 7 August 2015. The few Yorkshire records of this upland liverwort are in the north-west (Upper Teesdale, Upper Swaledale and Ribblehead).

Schistostega pennata: (64) SE14724527 Burley Woodhead, P.N. Gaunt, 4 June 2015. This is the famous 'luminous moss', or Goblin Gold. It grows in dark holes and crevices and has specialised cells that reflect light and therefore appear to glow.

Solenostoma obovatum: (65) SD8796 Lover Gill and vicinity, near Buttertubs, Upper Swaledale, T.L. Blockeel, S. Knight and L. Knight, 7 August 2015.

Sphagnum magellanicum: (64) SE00197034 Conistone Moor, G. Haycock, 29 December 2015.

Sphagnum teres: (64) SE00197031 Conistone Moor, G. Haycock, 29 December 2015.

Syntrichia papillosa: (62*) SE514811 on Ash tree by car park, Roulston Scar, below the White Horse, Kilburn, T.L. Blockeel, 10 October 2015; (64) SE46505552 tarmac, Kirk Hammerton, P.N. Gaunt, 20 May 2015; (65*) SD66319211 on willow by stream in village, Settlebeck Gill, Sedbergh, R. Guppy & Yorkshire Naturalists, 9 May 2015.

Taxiphyllum wissgrillii: (65) SE2976 sparsely on stones on bank near waterfall, High Batts, near North Stainley, T.L. Blockeel, 8 January 2015.

Tetraplodon mnioides: (65) SE0592 Cob Scar, S. Knight & R.H. Carter, 27 July 2015; (64) SE00597030 Conistone Moor, G. Haycock, 29 December 2015. A moss with a very unusual habitat, growing on bones and other animal remains.

Thuidium assimile: (65) SE29967666 gravelly calcareous ground in scrape, High Batts, near North Stainley, T.L. Blockeel, 8 January 2015.

Ulota calvescens: (64) SD86897988 on Sycamore with *Colura*, Beckermonds, Wharfedale, G. Haycock & M. Wilcox, 30 May 2015; (65*) SD66109267 on Hazel on bank above stream, Settlebeck Gill, Sedbergh, T.L. Blockeel and Yorkshire Naturalists, 9 May 2015.

Thanks are due to all the contributors of records.

Reference

Hill, M.O., Blackstock, T.H., Long, D.G. & Rothero, G.P. (2008) *A checklist and census catalogue of British and Irish bryophytes, updated 2008*. Middlewich: British Bryological Society.

Yorkshire Naturalists' Union Excursions in 2016

Marrick Park (VC65) 13-14 May 2016

INTRODUCTION (Terry Whitaker)
Just two moth-trappers turned up on the Friday evening but several traps were deployed around the estate with the help of Julia Carr. Early the next morning, which dawned dry and clear, they were examined but catches were disappointing. The conditions for the main meeting were very good despite being plagued by a cool north-easterly wind, the bright sun making it pleasantly warm and spring-like in shelter. The reporting meeting held in the gymnasium was generously catered for by Julia Carr and was attended by eleven people from six affiliated societies.

Thanks were expressed to Julia Carr and her land manager.

GEOLOGY (Terry Whitaker)
A sandstone orthoclast with spectacular annelid trails was noted incorporated into a boundary wall of High Park. This rock is possibly from the Faraday Marine Band of the Ten Fathom Grit (See Plate 7, centre pages). The limestone of the western quarries on High Park was burnt for agricultural lime in the well-preserved double hearth lime-kiln not far from the farmhouse.

FLOWERING PLANTS
In two previous visits John Newbould had recorded a list of over 150 species. This visit added a few more interesting ones in flower which included several plants of Meadow Saxifrage *Saxifraga granulata* near the river in Thorny Park (See Plate 7), a few plants of Green Hellebore *Helleborus viridis* in High Park near the house and a large (DBH >0.5m) Wild Apple tree *Malus sylvestris* sensu lato in the PAW (Plantation on Ancient Woodland) site near Low Oxque.

PLANT GALLS (Tom Higginbottom)
On arrival at the meeting it was a bonus to be welcomed by Terry Whitaker with old specimens of the Oak Marble Gall caused by the gall wasp *Andricus kollari* and an even more unusual stem gall on bramble caused by another gall wasp *Diastrophus rubi*. This gall is locally common but not often recorded. On a mature oak, old examples of the galls caused by the wasps *A. lignicolus* and *A. inflator* were also discovered. In spring the first generation of the Common Spangle Gall *Neuroterus quercusbaccarum*, often referred to as Currant Gall, occurs on the oak catkins and sometimes on the underside of the leaves. Even though there were many male catkins none were found; this has been a similar experience in other sites where oaks are in even greater abundance. This year the Common Spangle is likely to be rather uncommon. Mite galls seemed reasonably common. *Phytoptus avellanae* had enlarged buds on Hazel *Corylus avellanae*, *Phyllocoptes gonoithorax* had caused the leaf roll on Hawthorn *Crataegus monogyna* and *Eriophyes pyri* the pimples on Rowan *Sorbus aucuparia* leaves. Spikelets of a grass had been shortened, bunched and thickened by *Aceria tenuis*. Judith Allison suggested the host may be Yorkshire Fog *Holcus lanatus*; further specimens

were found during the meeting. In Thorny Park many leaves of the Bird Cherry *Prunus padus* had pimples of *Phyllocoptes eupadi,* a common gall on this host. A single midge gall was discovered, *Jaapiella veronicae*, which creates a hairy pouch on Germander Speedwell *Veronica chamaedrys* flower buds. Some fungal galls were also found: the Witches' Broom on Downy Birch *Betula pubsecens*, the bright orange *Puccinia urticata* which distorts the stems and leaves of Stinging Nettle *Urtica dioica* and the purplish smut on the anthers of Red Campion *Silene dioica*.

LEPIDOPTERA (Charles Fletcher & Terry Whitaker)

Moth trapping took place on the Friday night and several traps were set up in various parts of the estate. Unfortunately, the temperature fell sharply overnight and when the traps were examined in the morning only six species were found. The catch was not entirely without interest however as Powdered Quaker *Orthosia gracilis* and Early Tooth-striped *Trichopteryx carpinata* were new for the 10km square. Two interesting moths were found on the Saturday, flying by day. Speckled Yellow *Pseudopanthera macularia* is local in the county and this is a new site for this attractive moth whose larvae feed on Wood Sage *Teucrium scorodonia*. *Micropterix tunbergella* is also local with few records for VC65.

Butterflies seen on the 6 & 14 May included Small Copper, Small Tortoiseshell, Peacock, Speckled Wood, Green-veined White and Orange Tip.

DIPTERA and HEMIPTERA

The group reported seeing several specimens of the hoverfly genus *Eristalis* but the cowpat-inhabiting *Rhingia campestris* was the only syrphid definitely identified. Several specimens of the Bee Fly *Bombylius major* were seen, mostly near the riverside. *Bibio marci* was abundant everywhere with the males assembling around scrub Hawthorn.

A specimen of the bright black and red froghopper *Cercopis vulnerata* was seen, a bug more common in the south of the county.

HYMENOPTERA: Aculeata (Peter Flint)

Few bees were seen but the White-tailed Bumblebee *Bombus lucorum* was ubiquitous. The Common Carder Bee *Bombus pascuorum* and the Buff-tailed Bumblebee *Bombus terrestris* were also seen, as were a few cuckoo bees (*Nomada* spp.?).

MOLLUSCS (Terry Crawford & Adrian Norris)

This was the third occasion on which the Conchological Section visited Marrick Park. On our first visit on 24 June 2014 (with John Newbould) we came across the site as part of our survey of Swaledale. Walking down a long private drive from our parking place near Downholme Bridge we were surprised to come across an old limestone quarry known as High Park. At this point we met Julia Carr, the owner of the land, who subsequently invited us to return. On that first occasion we had very limited time and recorded only 16 species. The section took up her invitation on 29 June 2015 and was able to drive up to the quarry, giving us time to explore the area and record 31 species. On this occasion we also explored the two southern parts of the estate bordering the River Swale, where we located a further seven species, bringing our total to 38. The highlights, found on all three occasions, were the Heath Snail *Helicella itala,*

which has proved to be very local within Swaledale but is common at High Park Quarry SE09539821, and the wall-living Lapidary Snail *Helicigona lapicida*, which was located on several old drystone wall sites bordering the estate, at SE08799816, SE09739820, SE09749820, SE09539797, SE09609802.

FRESHWATER BIOLOGY (Sharon and Peter Flint)

The wooded, shingly banks of the River Swale provided good hunting for mayflies, stoneflies and caddisflies, both as adults and juveniles. Adults of the large stonefly *Perla bipunctata* (Perlidae) were abundant among the stones at and just above the water level. Other smaller stoneflies including *Isoperla grammatica* (Perlodidae) and *Amphinemura sulcicollis* (Nemouridae) were also abundant, both as juveniles in the river and as adults. Among the mayflies, adults and sub-adults of *Baetis rhodani* and *B. muticus* (Baetidae) were flying above the river and their juveniles were found in the water. Larvae of the caddisfly *Lepidostoma basale* (Lepidostomatidae) were abundant among the stones in shallow water near the river margin where we also found *Allogamus auricollis* (Limnephilidae) and *Ceraclea annulicornis* (Leptoceridae).

AMPHIBIANS and REPTILES (Terry Whitaker)

Common Frog was indeed common as tadpoles but only one live adult was seen. However, the remains of several predated adults were found by the river. A Common [viviparous] Lizard was seen. Grass Snakes were reported to occur in the area.

BIRDS (Jill Warwick)

A list of 36 species of birds was compiled. The more notable included a male Pied Flycatcher, several Redstarts and Blackcap. At least two Green Woodpecker were seen, no doubt favoured by the abundance of large ant hills of the Yellow Meadow Ant *Lasius flavus* on parts of Thorny Park (see Plate 7). It was also nice to hear two male Cuckoo in full song. In the Ash wood at the far western end of High Park is a rookery, this year with 14 occupied nests.

MAMMALS (Terry Whitaker)

Two occupied Badger sets were recorded and most fields had Mole hills. Several Roe Deer were seen and Brown Hares were unusually abundant and widespread. A single adult Hedgehog was seen.

Wharram Percy Medieval Village (VC61) 18 June 2016

INTRODUCTION (Sarah White)

The morning was disappointingly cool and breezy for June and, despite an improvement during the day, it remained dull. The area covered included a variety of different habitats at Wharram Percy, including the car park, the steep chalky slope beside the footpath, the stream and marshy grassland in the valley bottom, the churchyard, mill pond and the site of the deserted village itself. Several of the group also walked along the old railway line to Wharram Quarry. Eleven members attended the field meeting and eight, representing seven affiliated societies, were present at the tea and meeting held in Thixendale Village Hall.

FLOWERING PLANTS (Richard Middleton)

The walk into the valley from the car park near Bella Farm starts in the intensive arable environment now characteristic of much of the Wolds. Unfortunately, the field margins here were clean and failed to provide any interesting arable weeds. The lower slope of the descent was more rewarding, giving an overgrown preview of the chalk flora that would be seen to better effect in Wharram Quarry later in the day. The marshland and stream in the valley bottom were of more interest with records for both Hairy Sedge *Carex hirta* and Spiked Sedge *Carex spicata* along with Marsh Horsetail *Equisetum palustre*, Lesser Water-parsnip *Berula erecta*, Meadowsweet *Filipendula ulmaria*, Opposite-leaved Golden-saxifrage *Chrysosplenium oppositifolium* and the Hybrid Avens *Geum x intermedium* along with both parents. The grassland which now occupies the site of the deserted medieval village is much improved and of little botanical interest but the restored mill pond had some fine stands of Common Spike-rush *Eleocharis palustris*. A walk northwards on the track of the old railway, alongside the stream, gave useful records of Ragged-Robin *Silene flos-cuculi*, Zigzag Clover *Trifolium medium* and Wood-sedge *Carex sylvatica*. The YWT reserve at Wharram Quarry was, as always, a great pleasure. Its attractive, rich chalk flora included Common Milkwort *Polygala vulgaris*, Hairy St John's-wort *Hypericum hirsutum*, Autumn Gentian *Gentianella amarella*, Lady's Bedstraw *Galium verum*, Wild Thyme *Thymus polytrichus*, Pyramidal Orchid *Anacamptis pyramidalis* and Common Spotted-orchid *Dactylorhiza fuchsii*. The highlight was undoubtedly to see stout spikes of Thistle Broomrape *Orobanche reticulata* in several places, rising from the roots of Woolly Thistle *Cirsium eriophorum*.

PLANT GALLS (Tom Higginbottom)

It was quite early in the season for galls and I only recorded about fifteen different species. Generally, there was a poor variety of hosts. In Wharram Percy village the edges of the leaves of Wild Plum *Prunus domestica* were surrounded in the small pimples of the mite gall *Eriophyes similis*. Even more dramatic were some of the fruits, which had been enlarged and distorted by the fungus galler Pocket Plum *Taphrina pruni*. The erineum of the mite *Phyllocoptes malinus* was present on the underside of the leaves of a Crab Apple. In Wharram Quarry the central vein of Ash *Fraxinus excelsior* leaves had been enlarged and swollen by the midge *Dasineura fraxini*. The midge *D. kiefferiana* had rolled the edge of the leaves of Rosebay Willowherb *Chamerion angustifolium*. Another midge galler, *Jaapiella veronicae,* had thickened the leaves of Germander Speedwell creating a hairy pouch. On Meadowsweet growing beside the old railway line the pimples of the midge gall *Dasineura ulmaria* were visible on the leaves. On the upper leaves of Field Maple *Acer campestre* were the small almost spherical galls of *Aceria cephalonea* and on the undersides was the erineum of *A. eriobia*.

LEPIDOPTERA (Terry Crawford)

The morning was cool, the afternoon a bit warmer, and 2016 has so far been a poor year for Lepidoptera, so records were hard to come by. Some members visited Wharram Quarry where they saw Dingy Skipper, Large Skipper, Orange-tip, Green-veined White, Small Heath and Common Blue. The most abundant was Common Blue with only about eight individuals, indicative of the low numbers. A Speckled Wood and another Orange-tip were seen along the disused railway track. Singles of Silver-ground Carpet *Xanthorhoe montanata* and Common

Marble *Celypha lacunana* and a small swarm of Common Nettle-tap *Anthophila fabriciana* were by the path descending from the car park. In the sheltered area near the pond at the deserted village, a burst of sunshine brought out a few more Green-veined White and Silver-ground Carpet and a single Plum Tortrix *Hedya pruniana* was disturbed from a clump of Blackthorn *Prunus spinosa*, its larval foodplant. Perhaps the most significant observation was that careful searching failed to yield any Diamond-back Moth *Plutella xylostella*, despite the very large-scale migration of this potential pest that arrived in Great Britain at the end of May

INSECTS other than LEPIDOPTERA (Roy Crossley)

Complete heavy cloud cover and a chill wind, following days of unsettled weather, did not bode well for this meeting on the high Wolds. Nevertheless, the day produced an interesting set of observations at the afternoon meeting.

My own work was in the vicinity of the car park, mostly sweeping the boundary Sycamores *Acer psuedoplatanus* which proved to be quite productive, as is often the case. Several common empid flies were present and *Empis grisea* was particularly numerous. The common, bright-yellow crane-fly *Nephrotoma quadrifaria* was also present as were several common soldier flies, both *Beris vallata* and *B.chalybea* being recorded as well as *Chloromyia formosa*. It was pleasing to find examples of the largely arboreal dolichopodid flies *Neurigona suturalis,* which is localised and largely eastern in its Yorkshire distribution, and the tiny *Xanthochlorus ornatus*. A single example of *Leptharthrus brevirostris*, a typical robber-fly of the chalk grassland of the Wolds, was also swept.

Hoverflies were scarce, as has been the case all this year, but it was pleasing to have a report of the common bumblebee mimic *Volucella bombylans* in the area of the car park, and several Marmalade Hoverflies *Episyrphus balteatus* were seen. A photograph of *Cheilosia illustrata* taken during the day was shown to me at the meeting (see Plate 8, centre pages); this is one of the few members of this species-rich hoverfly genus which can be named with certainty from a photograph.

The distinctively-coloured slender bug *Miris striatus* was swept in the car park – this can often be seen hunting for prey on tree trunks. From the deserted village site there was a report of the conspicuous red and black froghopper *Cercopis vulnerata,* which appears to have spread widely across the county over the past sixty years. The late John Flint, my early mentor and doyen of Yorkshire entomologists, used to quip that had it been around in the past even the bird watchers would have noted it – no offence to bird watchers!!

Also at the meeting Richard Middleton showed a photograph of the large and distinctive longhorn beetle *Agapanthia villosoviridescens* which he had found at Wharram-le-Street, some distance from the meeting place but included here as it is worth noting. Bob Marsh, YNU recorder for Coleoptera, has kindly provided the following information: the beetle was first recorded in Yorkshire in June 2000 in the south of VC63, since when it has spread rapidly and widely with records now from all five vice-counties. It is found on thistles and Hogweed *Heracleum sphondylium*, larvae mining the stems of the host plants from top downwards, emerging at ground level to pupate in the soil.

MOLLUSCS (Adrian Norris)
Four members of the Conchological Section attended this meeting and we concentrated on the site of the old medieval deserted village. The molluscs were recorded in the past by the Norton Watch Group under the authority of Dr Terry Connor, the main archaeologist working on the site in 2007. They recorded some 24 species over a period in 2007; we hoped to add to this list as we had not looked at this site for that purpose. The area was much drier than expected and thus we found only 22 molluscs; however seven of these were additional to their list. The most surprising of these were small numbers of Pfeiffers' Amber Snail *Oxyloma elegans* which was found in the marshy areas by the pond; a specimen of Shining Pea Mussel *Pisidium nitidum* in the pond and the Blind Snail *Cecilioides acicula* in a Mole hill by the church. The other additions were all slugs, often overlooked or under-recorded in the past. A species we hoped to find was the Heath Snail *Helicella itala*. The Norton group located two adults on the hillside above the lake. We examined this area but could not find any suitable habitats for this very local snail.

BIRDS (Ken White)
37 bird species were recorded during the day, of which 16 were singing. The good number reflects the broad range of habitats present. Highlights were a population of Tree Sparrows with fledglings and 12 apparently active nests of House Martins on the cottages. Warblers included Common Whitethroat, Blackcap, Willow Warbler, Chiffchaff and Garden Warbler; Marsh Tit, Great Tit, Blue Tit and Long-tailed Tit were all evident as were Linnet, Yellowhammer, Goldfinch and Bullfinch. The only raptor was a Kestrel.

Ashberry YWT Reserve (VC62) 9 July 2016

INTRODUCTION (Tony Wardhaugh)
Just five members attended this meeting, perhaps owing in part to rain being forecast. This duly arrived just as the meeting was about to begin and continued until mid-afternoon. In addition, four members ran moth traps on the reserve during the previous night which, fortunately, was dry. The reserve includes a number of different habitats and it was possible for our small party to visit only parts of it during the day. At the end of the afternoon four members attended the tea and meeting in Rievaulx Village Hall. A vote of thanks was given to the Yorkshire Wildlife Trust, in particular to Elizabeth Round, Reserves Officer, for help in arranging the visit. Thanks are also due to the landowner, Sir Richard Beckett, for permission to hold the meeting, to Mr Walter Fenwick for kindly allowing us to park at Ashberry Farm and to Mrs Jean Bowes for arranging the hire of Rievaulx Village Hall.

FLOWERING PLANTS (Tony Wardhaugh)
The valley floor, Ashberry Pasture, is well known for its floral diversity. Plants noted on the day include Common Spotted Orchid, Heath Spotted Orchid *D. maculata* and their hybrid, Twayblade *Neottia ovata*, Fragrant Orchid *Gymnodenia conopsea*, Marsh Helleborine *Epipactis palustris* (see Plate 9, centre pages), Ragged Robin, Marsh Lousewort *Pedicularis palustris*, Globeflower *Trollius europaeus* and Common Butterwort *Pinguicula vulgaris*. Herbage in Ashberry Pasture appears to have become taller and more dense than it was

about ten or more years ago. For example, Lesser Pond-sedge *Carex acutiformis*, a species known to be rather invasive on sites such as this, appears to have spread a good deal. Black Bog-rush *Schoenus nigricans* appears to have been lost from Ashberry Pasture, this being one of the species for which this site was originally notified as a SSSI.

Four plants associated with ancient semi-natural woodland were located in Reins Wood, these being Wood Anemone *Anemone nemorosa*, Wood-sorrel *Oxalis acetosella*, Yellow Pimpernel *Lysimachia nemorum* and Woodruff *Galium odoratum*. All were found in the same area as the Plated Snail *Spermodea lamellata*, also a species of ancient semi-natural woodland (see below).

OTHER ARTHROPODS (Tony Wardhaugh)

Common Striped Woodlouse *Philoscia muscorum* and Common Shiny Woodlouse Oniscus asellus were found in the Ashberry Pasture area. In Dick Wood the Pill Millipede *Glomeris marginata* and the geophilid centipede *Stigmatogaster subterranea* were recorded. Ashberry Wood yielded the millipedes *Ophyiulus pilosus* and *Brachydesmus superus*, the Common Pygmy Woodlouse *Trichoniscus pusillus* and the harvestman *Nemastoma bimaculatum*.

LEPIDOPTERA (Terry Crawford and Charles Fletcher)

Moth trapping took place on the Friday night. Five traps were run overnight – three in the meadow area and two in woodland - and a further three were run in the evening in woodland areas. The total catch was 103 species with several of interest. The overnight traps were sorted in the morning and luckily this was just completed before heavy rain arrived.

Three examples of Barred Carpet *Martania taeniata* were unexpected and this is a new area for this moth of damp woodland whose nearest known population is almost 20 miles to the north east. Other interesting moths included Blomer's Rivulet *Venusia blomeri* and Clouded Magpie *Abraxas sylvata* – both local moths of elm-rich woodland, Dingy Shell *Euchoeca nebulata*, Welsh Wave *Venusia cambrica*, Satin Beauty *Deileptenia ribeata*, Pinion-streaked Snout *Schrankia costaestrigalis* and Grey Arches *Polia nebulosa*. There were 17 examples of Fen Square-spot *Diarsia florida* none of which were seen before midnight, backing up the suggestion that this species flies late at night unlike the closely related but double-brooded Small Square-spot *Diarsia rubi*.

Eight species of macro moth and 20 of micro-moth were new for the 10 km square. Amongst the microlepidoptera there were no real rarities but the most notable were *Pandemis cinnamomeana*, *Aethes cnicana, Eucosma hohenwartiana and Notocelia trimaculana*.

During the daytime meeting the only butterflies seen were several Ringlet, noted for flying in cloudy and cool conditions when other butterflies are inactive, but on this occasion even flying in persistent heavy rain. A few moths were disturbed which were likely to result from the light trapping of the previous night, but one active individual of the day-flying Chimney Sweep *Odezia atrata* was notable given the conditions.

MOLLUSCA (Terry Crawford and Tony Wardhaugh)
Two 1km squares were visited with 38 records being made of 33 species. The Large Amber Snail *Succinea putris* was abundant, being found on tall herbage in the valley bottom. This population included a number of dark-bodied individuals (no Pfeiffer's Amber Snails *Oxyloma elegans,* which is dark-bodied and externally very similar to *S. putris,* were found on the site). In this area several Large Black Slugs *Arion ater* seg. were seen, one of which demonstrated the characteristic rocking motion of this species when disturbed. Also found here were the Silky Snail *Ashfordia granulata* and the diminutive Toothless Chrysalis Snail *Columella edentula*. Just inside the eastern edge of Reins Wood it was very pleasing to find the Plated Snail, which is virtually confined to ancient semi-natural woodland in the British Isles, present in considerable numbers (SE56758459). It is a declining snail, withdrawing northwards especially in eastern England, and this site is on the southerly edge of its north-eastern range. This record is also of interest because it has been found previously on the eastern side of the valley in Ashberry Wood (adjacent to the east side of Clavery Ley Lane, SE569848, 09.06.2013, A A Wardhaugh) suggesting that it could be widespread in this woodland complex. Another snail associated with old woodland, the English Chrysalis Snail *Leiostyla anglica,* was found at the same place in Reins Wood. In all, 23 species were recorded in Reins Wood with more very likely present.

To end the day the party walked up Clavery Ley Lane to look for the Round Mouthed Snail *Pomatias elegans* (see Plate 9, centre pages) at one of only two localities where it is known to occur in VC62. The other is Forge Valley, the most northerly British site. Live individuals were found by the side of the lane at the north-east edge of Dick Wood (SE5664.8545) just outside the YWT reserve boundary and only a few hundred metres geographically south of Forge Valley. Along the way seven species of mollusc were recorded in Ashberry Wood on the eastern side of the lane, within the reserve, including the Plaited Door Snail *Cochlodina laminata*, the Lesser Bulin *Merdigera obscura*, and the Tree Slug *Lehmannia marginata*.

Austerfield Mosaic Trust Reserve (VC63) 23 July 2016

INTRODUCTION (Joyce Simmons)
A hot and sunny day brought 18 members of 10 affiliated societies to Austerfield. This reserve is cared for by The Mosaic Trust, a voluntary body, with an independent Field Centre which provided us with a car park and facilities for our afternoon meeting.

Sand quarrying has exploited the Quaternary sand and gravel deposits over many years and is still continuing on areas adjacent to the reserve. The habitat is quite mixed, with mature oak trees on boulder clay and Silver Birch *Betula pendula* predominating where there is woodland on sand. There are also permanent and seasonal ponds as well as scrubby areas. Bare sand supports sparse communities of specialised plants which are able to tolerate the dry conditions. Since the weather had been so hot many plants were tiny, causing the botanists to unfurl their hand lenses to actually see the plants.

On the evening before the Excursion, several moth trappers assembled with around 10 traps, 4 of which were mercury vapour. An impressive range of moths was attracted, the star of the evening being a Privet Hawk Moth (see Plate 10, centre pages) with its 10cm wing span, a first in Yorkshire for Harry Beaumont!

The tea meeting revealed some interesting findings, as detailed in the following reports, and recommendations were suggested for future management. It was felt that various invasive plants should be curbed – New Zealand Pygmyweed *Crassula helmsii* which is taking over the permanent pond; Gorse *Ulex europea,* Hawthorn and Bracken *Pteridium aquilinum* which are spreading in sandy areas. Bare ground is very valuable and should be encouraged to allow the slow-growing non-aggressive plants to spread. More ponds were suggested, but it was appreciated that this is a problem on sandy soil without clay.

I would like to thank The Mosaic Trust for their hospitality, and in particular Sue Rose and Mick Townsend for giving me a great deal of help and making it a very enjoyable day.

LICHENS (Mark Seaward)

This former sand quarry proved lichenologically rewarding in terms of the extensive treeless areas which were dominated by lichens and bryophytes. After a few decades of abandonment, a characteristic lichen-bryophyte heath has been generated, the like of which has sadly disappeared from many lowland areas of eastern England during the past two centuries. The carpet of various *Cladonia* and *Peltigera* species represents the early successional stages which in due course, if left unchecked, will be overshadowed by higher plants, more particularly birch. Plates of *Peltigera*, measuring on average 16 to 20 cm, interspersed with *Cladonia* (up to 9 spp.) and bryophytes, particularly *Campylopus introflexus*, clothed the earth. A further component of the terricolous lichen flora was *Cetraria aculeata*, the frequent occurrence of its bunched brown thalli demonstrating a vagrant form that aids their spread, as also shown by the normally epiphytic *Evernia prunastri*. Here and there the ground was covered with crusts of *Baeomyces rufus* and, more rarely, by *Diploschistes scruposus*; an even closer inspection revealed that pebbles, when left undisturbed for several years, had been colonised by saxicolous lichens such as *Porpidia* and *Verrucaria* species, their presence, like the adjacent terricolous lichens, indicative of soil stability. Lichens on mature trees were scarce throughout the reserve but sapling trees and their attendant posts occasionally supported crustose (mainly *Lecanora* spp.), foliose (mainly *Melanelixia*, *Physcia* & *Xanthoria* spp.) and fruiticose (*Ramalina farinacea*) epiphytes, the nitrophytes of which reflected local or widespread use of agrochemicals and animal husbandry practices.

FLOWERING PLANTS (Louise Hill)

The meeting was attended by a number of Doncaster Naturalists' Society members and YNU botanists, including the welcome attendance of Don Grant, back in the field after a period of illness. Our walk commenced from the Field Centre taking in the colonies of Slender Parsley-piert *Aphanes austr*alis on the dry bare sandy slopes leading down into the restored quarry void.

The main components of the dry acid grassland are Common Bent *Agrostis capillaris and* Sheep's Fescue *Festuca ovina,* with Sheep's Sorrel *Rumex acetosella*, Mouse-ear Hawkweed

Pilosella officinarum, Buck's-horn Plantain *Plantago coronopus,* Heath Speedwell *Veronica officinalis,* Heath Woodrush *Luzula multiflora*, Ribwort Plantain *Plantago lanceolata*, Bird's foot *Ornithopus perpusillus*, Common Centaury *Centaurium erythraea,* Common Mouse-ear *Cerastium fontanum*, Common Stork's-bill *Erodium cicutarium,* Cat's-ear *Hypochaeris radicata*, Scarlet Pimpernel *Anagallis arvensis* and Common Cudweed *Filago vulgaris*. This acid turf is interspersed with areas dominated by *Cladonia* lichens and *Polytrichum* mosses.

There are localised colonies of rare acidophiles such as Shepherd's Cress *Teesdalia nudicaulis,* Spring Vetch *Vicia lathyroides*, Smooth Cat's-ear *Hypochaeris glabra*, Little Mouse-ear *Cerastium semidecandrum,* Lesser Chickweed *Stellaria pallida,* Early and Silvery Hair Grasses *Aira praecox* and *A. caryophyllea,* Squirrel-tail Fescue *Vulpia bromoides*, Rat's-tail Fescue *Vulpia myuros* and Biting Stonecrop *Sedum acre*. A sand mound near the centre of the reserve supports a dense stand of Sand Sedge *Carex arenaria*.

The striking, large, 'inverted candelabra' inflorescences of the neophyte Hungarian Mullein *Verbascum speciosum* were admired by the group. Areas of birch scrub (both Silver and Downy) had scattered Grey Willow *Salix cinerea* and occasional Goat Willow *S. caprea* together with other common shrubs. Areas of mature oak woodland support patches of Creeping Soft-grass *Holcus mollis* and Wavy Hair-grass *Deschampsia flexuosa*.

The sand quarry also includes several small water bodies and one larger, recently created pond. The small ponds all have very shallow edges and support a range of marginal and aquatic plants (including Thread-leaved Water-crowfoot *Ranunculus trichophyllus*, New Zealand Pygmyweed, Canadian Pondweed *Elodea canadensis*, Fringed Water-lily *Nymphoides peltata*, Floating Sweet-grass *Glyceria fluitans*, Common Spike-rush and Tufted Forget-me-not *Myosotis laxa*.

Willow Holt, a much larger, deeper water body lies on a stream which borders the western side of the Reserve. This pond is surrounded by willow scrub and supports some extensive stands of Yellow Flag *Iris pseudacorus* and marginal areas dominated by Water-pepper *Persicaria hydropiper*. Small Water-pepper *Persicara minor* is also known to occur here but this year's wet season meant that the pond margins had only recently been exposed and the growth of the water-pepper was only at a very early stage. A single plant of Bladder Sedge *Carex vesicaria* grows on the water's edge. A small pocket of acid grassland to the west of the pond is the only location on the site currently known to support a colony of Wild Pansy *Viola tricolor* subsp. *tricolor* although more extensive colonies are known just outside the current site boundary to the southwest and at Gally Hills near King's Wood, Bawtry. The dense Bracken and bramble scrub across the path prevented access to this area.

Other notable plants first found only recently and seen during the visit were Pennyroyal *Mentha pulegium*, Fragrant Agrimony *Agrimonia procera* and Wood Small-reed *Calamagrostis epigejos*.

The tour took in a small plant of Hybrid Polypody *Polypodium interjectum* growing on the sandy bank in the north-western corner of the site, before returning via a newly leased section of the reserve which includes a small pond perched improbably above a high sand

cliff. The pond banks support a small colony of Southern Marsh-orchid *Dactylorhiza praetermissa* and Marsh Horsetail. A shallow scrape pond nearby supports Water Purslane *Lythrum portula*.

The group returned from this scorching semi-desert environment for some very welcome refreshments at the Field Centre.

PLANT GALLS (Tom Higginbottom)

Along Highfield Lane on the northern edge of the Mosaic Trust leaves of Alder Buckthorn *Frangula alnus* had been rolled by the psyllid *Trichochermes walkeri*. The fruits of Wild Plum had been swollen and distorted by the Pocket Plum fungus. In an achene of burdock was evidence of blackened callus tissue caused by the dipteran galler *Tephritis bardanae*. On Wych Elm *Ulmus glabra* on the eastern edge of the Trust two aphid galls were found, *Eriosoma ulmi* rolling some leaves and an example of the stalked club-shaped fig gall *Tetraneura ulmi*.

In the grounds of the Trust ten different galls were discovered on the oaks. As at other sites I have surveyed this year the Common Spangle Gall was less frequent than the Silk Button *Neuroterus numismalis*, although the Oyster Gall *N. anthracinus*, usually attached to the midrib of the leaf, was the most abundant. The Artichoke Gall *Andricus fecundator* seemed common on the buds of some immature oaks but absent from others, even those nearby. Many acorns had been attacked by the Knopper Gall *A. quercuscalicis*. Hardly any of the common galls were discovered on the sallows apart from the small pimples of the mite *Aculus laevis* and the orange fungus *Melampsora caprearum*. The thickened pouch of the midge *Dasineura urticae* was eventually found on Stinging Nettle. Swollen buds of Common Ragwort *Senecio jacobaea* were investigated, revealing the midge larvae of *Contarinia jacobae*. The fungus *Puccinia glechomatis* was common on the leaves of some colonies of Ground Ivy *Glechoma hederacea*.

ARACHNIDS (Geoff Oxford)

The hot, dry nature of the site suggested it might be suitable for the rarer species of Candy-stripe Spider *Enoplognatha latimana* (Theridiidae), and so it proved to be. This spider was first recorded in Yorkshire by Bill Ely in 2005 and 2006 from brownfield sites in Rotherham. Richard Wilson subsequently found it near Stainforth in 2015. It is not clear whether this spider is spreading or just being better recorded – for many years it was conflated with the common and widespread *E. ovata*, which was also found at Austerfield. The most noticeable spider on the Reserve was the Labyrinth Spider *Agelena labyrinthica* (Agelenidae), a largely southern species that has only very recently been recorded in South Yorkshire by Joyce Simmons. This is currently its northern limit on the eastern side of Britain, although there are a couple of historic records from North Yorkshire. Its funnel-webs were present in some numbers in scrub gorse and bramble with the occupant lurking at the mouth of the retreat. In some cases mature males and penultimate females were co-habiting within the funnel; the male waits for the female to moult before mating can commence. Other typical grassland species included the Nursery-web Spider *Pisaura mirabilis* (Pisauridae), identified from its unique egg sacs and tents, and the Grass Mimic *Tibellus oblongus* (Philodromidae) – always a pleasure to find. In the wooded area a *Tegenaria gigantea* penultimate female (reared to maturity) and the distinctive egg sacs of *T. agrestis* were found under logs. *Tegenaria agrestis*

produces a curious egg sac with a layer of soil incorporated beneath the outer covering of silk. In my experience no other spider does this. Finally, Derek Whiteley swept a lovely female *Heliophanus flavipes* (Salticidae) from low vegetation.

LEPIDOPTERA (Paul Simmons & Mick Townsend)
On a reasonably warm and sunny day a total of 15 butterfly species was reported by the members present. The list included all the whites (except for Brimstone) and browns (including Small Heath) which could reasonably be expected at this time of year. Lycaenids were restricted to a small number of recently emerged Brown Argus and 2 Small Coppers. Nymphalids were in short supply, perhaps reflecting the cool weather at the time of their first broods and only 2 Red Admirals and a single Comma were seen. There were a number of Small Skippers, but the most interesting find was of 2 Essex Skippers (by Derek Whiteley). PS found Essex Skippers about 5 miles away last year, and other sightings in the area confirm that it is now well established to the south and east of Doncaster.

Other than common grass moths there were few day-flying species visible. Even the Ragwort seemed to be free of Cinnabar *Tyria jacobaeae* larvae, though a handful were seen.

OTHER INSECTS (Derek Whiteley & Gavin Boyd)
It proved to be a very interesting and productive day for insects. The combination of hot sunny weather and a unique site with scarce habitats produced a fascinating assemblage of insects including rare and localised species. There are undoubtedly many other 'goodies' to be discovered at this site.

Hymenoptera. In hot sandy habitats the solitary bees and wasps always promise to be interesting. We were delighted to find a colony of Sand-tailed Digger Wasps *Cerceris arenaria* and the rarer Ornate-tailed Digger Wasp *C. rybyensis* was the highlight of the day. The latter has been previously recorded from a nearby site but is quite rare in Yorkshire. Bees included the locally scarce Clover Melitta *Melitta leporina* and the Red-tailed Cuckoo Bee *Bombus rupestris,* a declining species with few recent Yorkshire sightings. The sand-nesting sphecid wasp *Oxybelus uniglumis* was quite frequent. The ichneumon *Sussaba erigator* (Diplazontinae) from the sand pit is the second confirmed Yorkshire record and the first for VC63.

Diptera. Stiletto flies (Therevidae) provided the excitement of the day. The beautiful Coastal Silver-stiletto *Acrosathe annulata,* an insect of sand dunes but exceptional inland, and the more frequent Common Stiletto *Thereva nobilitata* are always exciting to see. The silver-faced *Metopia* parasites of the sand digger wasps were abundant. Robberflies (Asilidae) were disappointing. Only *Leptogaster cylindrica* was found, albeit in very large numbers, but the larger ones typical of sandy habitats were elusive on the day. Hoverflies included the localised *Paragus haemorrhous,* an insect of bare ground and sparse vegetation, and the handsome wasp mimic *Chrysotoxum bicinctum* together with a plethora of common species. Picture-winged Tephritids or gall flies were represented by *Tephritis formosa,* a gall former on sow thistles, and the very pretty *Anomoia purmunda* that develops in fruits of hawthorns and wild roses. Most snail-killing flies (Sciomyzidae) proved to be *Limnia unguicornis* (on careful examination of male terminalia) or *Pherbellia cinerella,* both predators or parasitoids of

aquatic snails. The beautiful, if somewhat annoying *Chrysops relictus* females were the only horseflies recorded.

Hemiptera. The Ant Damsel Bug *Himacerus mirmicoides,* a pretty convincing mimic of a large black ant, was tolerably common. It is a recent arrival in South Yorkshire and still quite localised. *Calocoris roseomaculatus*, a mirid bug of dry sparsely vegetated habitats, was the other notable find.

Orthoptera were well represented by four different grasshoppers. The most abundant and widespread was the bare ground loving Mottled Grasshopper *Myrmeleotettix maculata* and the most interesting was the Lesser Marsh Grasshopper *Chorthippus albomarginatus*, an insect that has spread from the south-east in response to climate change. In addition Common Ground-hopper *Tetrix undulata* was found in drier areas and Slender Ground-hopper *T. subulata* favoured moist areas around the ponds.

The ponds attracted a good range of dragonflies and damselflies. Emperor Dragonflies *Anax imperator* put on a good show. Common Darters *Sympetrum striolatum* were abundant, Black-tailed Skimmers *Orthetrum cancellatum* were ovipositing and Broad-bodied Chasers *Libellula depressa* and Four-spotted Chasers *L. quadrimaculata* were also present around the main ponds. A male Common Hawker *Aeshna juncea* and two Brown Hawkers *A. grandis* were seen by Mick Townsend. Amongst the damsels, *Calopteryx splendens*, the Banded Demoiselle, favoured the education pond near the field centre. Dancing around like exotic butterflies they provided a suitable end to an excellent day's entomology.

MOLLUSCS (Adrian Norris)

What proved to be a very hot day preceded by several days of similarly hot weather made it difficult to fully record the molluscs due to the very dry conditions. Twenty-one species were found, however, spread throughout the area of the reserve. Considering the sandy-gravelly location we were greatly surprised about the lack of specimens normal for such conditions, such as the Wrinkled Snail *Candidula intersecta* and the Striped Snail *Cernuella virgata,* both of which we only found in small numbers. The most interesting mollusc was the Capped Orb Mussel *Musculium lacustre w*hich was very common in the fine mud of the dipping pond situated close to the entrance to the reserve.

BIRDS (Paul Simmons & Mick Townsend)

At this point in the season birds are not very visible. Few surprises were noted in the list reported by attendees and the most interesting find (by Terry Crawford) was off the reserve in an adjacent field – a small flock of Lapwing. The woodland held the usual tits and warblers with 'tekking' Blackcaps and singing Chiffchaffs being the most noticeable. Both Great-spotted and Green Woodpeckers were heard and a Treecreeper was seen in the mature oak trees on the western edge of the reserve. A vocal Buzzard was much in evidence during the day and there were good numbers of Sand Martins from the colony in the adjacent sand quarry.

Ingleborough Nature Reserves (VC64) 19-20 August 2016

INTRODUCTION (Terry Whitaker)
As is often the case in late August in the north-west of Yorkshire, summer, such as it had been, had been deteriorating for a week and a bad prognosis of more wind and rain made more people cancel their visits than turned up. By the time nine stalwarts assembled at 10.30 on Saturday for the field meeting it was pouring down and the wind was approaching a full gale. Brief excursions were made close to Colt Park until everybody retreated to the comfort of Colt Park Barn to dry out and do identification work on their samples. Many people were mentored in identification of groups they were not specialist in. Then there was tea and abundant home-made cakes. The reporting meeting was chaired by Peter Flint and the 11 people were from 8 affiliated societies. Derek Whiteley revisited the sites a few days later in better weather and greatly added to the records list.

Colin Newlands gave a brief history of the restoration of Colt Park Hay Meadows which twenty years ago were classed as semi-improved. Following research by the University of Newcastle they have been restored by Natural England to their former glory through the Yorkshire Dales Millenium Trust's 'Haytime' project. The rewilding of South House Moor by grazing exclusion and replanting was also discussed.

Thanks were given to Colin Newland (Manager, Ingleborough Nature Reserves) and to Natural England (NE) for providing the meeting room and microscopes and to NE and the Yorkshire Wildlife Trust for access to their reserves.

GEOLOGY
Terry Whitaker drew attention to the ancient boundary wall near Colt Park Wood. This contains several eroded orthostats (upright stones) and possibly dates from the Iron Age (see Plate 11, centre pages).

FUNGI
The group reported seeing Common Earthball *Scleroderma citrinum* and *Boletus erythropus* at Scar Close Moss, Honey fungus *Armillaria mellea* by the Colt Park Farmhouse.

FERNS (Tony Moverley)
The rain put me off Colt Park Wood SSSI (hidden & slippery limestone grykes!) but I did manage to visit the YWT reserve Salt Lake Quarry (monad SD7778) for an hour or so with a view to recording the ferns there. I found 8 species, including at least four Rigid Buckler-fern *Dryopteris submontana* plants on the cliff face. There was also at least one plant of Scaly Male-fern *Dryopteris borreri*. The others were Male-fern *Dryopteris filix-mas*, Maidenhair Spleenwort *Asplenium trichomanes* subsp. *quadrivalens*, Brittle Bladder-fern *Cystopteris fragilis*, Hart's-tongue *Asplenium scolopendrium*, Wall-rue *Asplenium ruta-muraria* and Common Polypody *Polypodium vulgare*.

FLOWERING PLANTS (Phyll Abbott and Kay McDowell)
The plan for the day was to record what was within an exclosure and new plantation on the lower slopes of Park Fell, near Colt Park Barn, in order that it can be reviewed again in a few years to see what changes there may be.

Within the area we found five sedges: Flea Sedge *Carex pulicaris*, Tawny Flea Sedge *C. hostiana*, Carnation Sedge *C. panicea*, Star Sedge *C. echinata* and Green-ribbed Sedge *C. binervis*. Also there were Bird's-eye Primrose *Primula farinosa*, sadly not in flower, Marsh Horsetail, Bilberry *Vaccinium myrtillus*, Bog Asphodel *Narthecium ossifragum*, Wild Thyme, Yellow Pimpernel and Marsh Violet *Viola palustris*. Nearby but outside the survey area we saw Montane Eyebright *Euphrasia officinalis* ssp. *monticola* and Bristle Clubrush *Isolepis setacea*.

MOLLUSCS
The group reported the Black Slug, the Red Slug *Arion rufus* and the Garlic Snail *Oxychilus alliarius*.

LEPIDOPTERA (Terry Whitaker)
The YNU Lepidoptera Group was invited to attend on the Friday night and, despite a day of heavy rain, a hardy band of nine Yorkshire moth trappers set up several traps in a variety of habitats during a weather window. Five 1km squares (SD7777; SD7778; SD7776; SD7577; SD7678) were covered around Ribblehead. The night was cloudy if a little cool but the wind was rising. The only traps with many moths were those set in relatively sheltered areas. 37 species of moths (417 individuals) were recorded, none of which was new for the fairly well recorded 10km square SD77, which has about 438 species including 175 micro-moths.

The most notable amongst the macrolepidoptera were mostly those typical of upland sites - Northern Rustic *Standfussiana lucernea*, Haworth's Minor *Celaena haworthii* and Square-spot Rustic *Xestia xanthographa*. The most common were Antler Moth *Cerapteryx graminis* (60 individuals) and ear moths. Every one of the latter that was dissected (24 out of 50) proved to be Crinan Ear *Amphipoea crinanensis*. Ribblehead Quarry NR produced the most interesting moths, particularly Flounced Rustic *Luperina testacea,* now rarely recorded on the high ground of the far northwest. It was only recorded in numbers (6) in Ribblehad Quarry but one was caught on Scar Close. Two Juniper Pugs *Eupithecia pusillata* were recorded. These were undoubtedly from the dozen very healthy planted Juniper *Juniperus communis* bushes in the Nature Reserve. This set TMW thinking that the quarry could be a suitable recipient site for translocating the rare Chestnut-coloured Carpet *Thera cognata*, which is struggling to survive elswhere in the *Phytophthora*-blasted Juniper populations of Ingleborough (Moughton).

COLEOPTERA (Peter Flint)
Records included *Carabus problematicus*, the large purple ground beetle more commonly found in heathy areas than the similar *C. violaceus*; the semi-aquatic staphylinid beetle *Dianous coerulescens* which skims rapidly over the water surfaces (Ribblehead Quarry NR - see Plate 11, centre pages) and the burying beetle *Necrophorus investigator* (light trap at Scar Close NNR).

HYMENOPTERA (Derek Whiteley)
The weather conditions were not conducive to field recording but I noted four species of bumblebee near Colt Park which included the Bilberry Bumblebee *Bombus monticola* in fairly good numbers alongside the more common Red-tailed Bumble Bee *Bombus lapidarius*.
Hymenopteran Parasitica from the moth traps were being forwarded to Bill Ely.

OTHER INSECTS AND INVERTEBRATES (Derek Whiteley)
A few days later sunny weather produced a list of hoverflies (Diptera: Syrphidae) that included *Platycheirus scambus,* the large wasp mimic *Sericomyia silentis,* the bumblebee mimic *Eristalis intricarius* and the wetland 'footballer' *Helophilus hybridus* in the wet flushes above Colt Park Barn, *Platycheirus granditarsus* at Gearstones, *Eristalis horticola* and *Eupeodes latifasciatus* at Ribblehead Quarry NR. The picture-winged snail-killing fly *Trypetoptera punctulata* (Sciomyzidae) was a nice find at that quarry and the long-legged dolichopodid fly *Liancalus virens* was found in its favoured habitat by the waterfall. Two species of dragonfly, the Common Darter *Sympetrum striolatum* and the Black Darter *S. danae* were hunting around the ponds.

Pill Millipedes *Glomeris marginata* and the lime-loving Rosy Woodlouse *Androniscus dentiger* were under stones in Ribblehead Quarry NR and the harvestman *Mitopus morio* var. *ericaeus* was swept from low vegetation. This moorland form is darker and larger than the typical form. The Rosy Woodlouse was also found around Colt Park Barn.

FRESHWATER BIOLOGY (Sharon and Peter Flint)
The Aquatic Ecology Section started the day early by collecting adult caddisflies and mayflies from the various light traps that the lepidopterists and ourselves had been running during the previous night to add to the records from other moth trapping near Ribblehead (see article on p163). Some non-aquatic insects also attracted our attention. These included the Common Pond-skater *Gerris lacustris* and Water Cricket *Velia caprai* (both Heteroptera). Tipulid larvae were observed by the Colt Park Barn stream.

A full list of aquatic invertebrates encountered will be published along with the report of the section meeting to Ribble Head Quarry NR on 17 September 2016.

BIRDS
Because of the very poor weather very few birds were noted but they included Swallows, which were rearing a second brood in Colt Park Barn, Meadow Pipit, Kestrel, and Rooks.

MAMMALS
Whilst the moth trappers were putting out their traps, Derek Whiteley used a Batbox Duet detector to record bats around Colt Park on the Friday evening. Common Pipistrelles *Pipistrellus pipistrellus* were feeding around the Salt Lake railway bridge together with a single *Myotis* bat (Whiskered Bat group) feeding along the adjacent access track at SD772783. A single Soprano Pipistrelle *Pipistrellus pygmaeus* appeared to be holding territory at Colt Park Barn, flying along a regular beat and vocalising strongly.

The group reported seeing two Brown Hares, Rabbit and Molehills as well as a domestic cat, and a dead Hedgehog was recorded at Selside.

Letter to the Editors

Membership Survey

I hope you will forgive my handwriting but I pen this letter to you with a sense of outrage of what I have discovered today.

The Naturalist December 2015 Number 1090 gave notice (p180) of a membership survey to be carried out by the YNU. This would be available in both electronic and paper format. As a member for 48 years I looked forward to having some input. Today I read that the results of this survey have been received and the conclusions from that survey are to be found in *The Naturalist* August 2016!

I was shocked to be told that only those contactable by electronic means were consulted. What sort of a membership survey is that? What message does that send to non-email members?

Furthermore, the results show that 112 completed questionnaires were received from individual members and the writers of the report are delighted with the response! Tell me what percentage of the membership is that! I now know that my 48 years of membership counts for nothing. Could there be others like me without email? Mr John Cudworth who sadly died earlier this year and joined the YNU in 1948 also had no email address. It should be noted that in his will he saw fit to leave the sum of twenty thousand pounds to the YNU. What would he have thought of this exclusion?

I realise that it would have been difficult to place the survey in the form of a flier to each member with each copy of *The Naturalist*.

I suspect that not all the right questions were asked of the membership. Some of the answers were not completely understood. Ticking boxes does not necessarily give good answers. Could I ask who authorised such a membership survey?

I have supplied records every year for 48 years. I have met many members holding important positions – some have sought counsel from me. But never before have I felt so devalued. I have always been a proud member and even today eager to learn more. But I do know the meaning of Union. Certainly selecting members for a membership survey does not seem like Union.

Questions need to be asked regarding this survey. Unity means together.

David Proctor, Wakefield, West Yorkshire

Response from Paula Lightfoot, Andy Millard and Barry Warrington

Dear Mr Proctor,

Many thanks for your letter and for the opportunity to respond to the points you have raised. The survey was carried out as part of a larger ongoing project to review YNU membership administration and was authorised by the YNU Trustees. We took responsibility for coordinating this project on behalf of the Trustees.

The survey was made available as an online form via the Survey Monkey website, as a Word document via e-mail and as printed copies at the YNU conference. We regret that due to lack of volunteer manpower it was not possible to send out printed copies by post and digitise handwritten responses. This decision was taken following discussion at the Natural Sciences Forum on 27th February 2016, of which the minutes are available on the YNU website. To minimise the impact of this, we made an effort to obtain e-mail addresses for YNU members who had not previously provided them and succeeded in adding around 100 e-mail addresses to the membership database.

The 112 responses received from individual members represent 27% of our current membership. We were delighted, not just with the quantity but particularly with the quality of responses. The survey comprised 30 questions, many with several parts, and included several open questions for free text responses. We did not expect 100% response rate even from members with e-mail addresses and were pleased that so many took the time to complete the rather lengthy survey and to take advantage of the free text questions to make useful suggestions, comments and offers of help.

We sincerely apologise that we were not able to send the survey out by post and digitise handwritten responses and re-iterate that this was purely due to lack of volunteer manpower, not any disregard for the opinions of those without e-mail addresses.

We would like to stress that this survey was just a small first step in an ongoing project to review membership administration. It was intended as a catalyst for discussions and actions.

The YNU always welcomes input from members wishing to contribute ideas for its development and willing to take action to deliver them. We are holding a conference on the 8th April 2017 in York with the aim of bringing together YNU members, sections and affiliated societies to showcase their current work and discuss ideas for future projects, events and activities. We hope that this will attract a cross section of membership, from those with many years valuable experience to share, to newer members whose active engagement will take the YNU forward.

There are also many other ways for members to have their say about the future development of the YNU - everyone is welcome to attend meetings of the Natural Sciences Forum and the AGM and we welcome correspondence by letter to the YNU Trustees or via our website or social media.

Please accept our apologies for any offence caused, this was not our intention, and please do get in touch with any suggestions regarding any areas of the YNU's work.

Yorkshire Naturalists' Union Conference 2017

The Yorkshire Naturalists' Union conference will be held on **Saturday 8 April 2017** in **Hendrix Hall, University of York**.

The conference theme is :

'Yorkshire's natural history societies – for naturalists, for nature, for the future'.

Speakers from the YNU and affiliated societies will showcase current work and lead discussions about ideas for future projects, events and activities.

The keynote address will be delivered by **Roger Morris**, who is one of the organisers of the Hoverfly Recording Scheme and regularly writes on the subject of biological recording. Roger will discuss 'a new paradigm in biological recording' that presents both challenges and opportunities. Roger is never one to step far away from controversy so his ideas should provide food for thought.

This will be followed by three sessions of presentations and group discussions:

Session 1: **For naturalists**

- Inspiring new naturalists
- Developing skills in natural history
- Communicating with members and beyond

Session 2: **For nature**

- Studying and recording wildlife
- Turning records into information
- Conserving Yorkshire's special places and species

Session 3: **For the future**

- Bigger, better, more joined-up – the future for Yorkshire's natural history societies

Throughout the day there will be natural history displays, book sales and plenty of time for networking. It will be a great opportunity to discuss the issues and suggestions raised by the recent YNU membership survey (see previous issue of *The Naturalist* for details), and for newer members to meet others and find out more about the YNU.

Most importantly, we want these discussions to lead to action and better support from the YNU for our members and affiliated societies. This is your society – please come along and have your say!

Conference tickets will be £25 for YNU members and £30 for non-members. This includes the conference lunch and refreshments. A booking form is included with this issue. Alternatively, you can book online at www.ynu.org.uk/conference2017

The programme will be published on the YNU website in due course.

If you would like to provide a display or facilitate discussions about current or potential future activities to support the understanding, enjoyment and conservation of Yorkshire's natural history, please contact the conference organiser, Paula Lightfoot, on:

p.lightfoot@btinternet.com or 07539 340128.

YNU Calendar 2017

Details are shown of events up to August. Up-to-date information can be found at YNU.org.uk/events.

Feb	11	Natural Sciences Forum. Function Hall, St Chad's Parish Church, Leeds 10.30-12.30.
	11	YNU Executive meeting. St Chad's Parish Church, Leeds, 1.30-3.30.
	25	Entomological Section Recorders' Reports and Conversazione. Wilberfoss Community Centre, York, 10.30 to 4.30.
Mar	12	Lepidoptera Group Annual Meeting. Bramham Village Hall 11.00.
Apr	8	**YNU Conference and Exhibition**. Hendrix Hall, University of York.
	15	Joint meeting of the Conchological and Freshwater Ecology Sections. Egton Bridge (NZ804504). Meet at 11.00.
	22	Botanical Section VC63 Field Meeting. Details tbc.
May	tba	Entomological Section Field Meeting at Ingleborough Nature Reserve. Meet at Colt Park Barn (SD772777). See YNU website.
	4	Entomological Section Field Meeting at Three Hagges Jubilee Wood, Escrick. Meet at the gate (SE627394) at 10.30.
	6	Joint meeting of the Conchological and Freshwater Ecology Sections. Jugger Howe Moor (SE940990). Meet at 11.00.
	6	Bryological Section Field Meeting at Arkengarthdale (VC65). Meet at 10.00 in the car park on the south side of Langthwaite (NZ005023).
	20	**VC64 Excursion** to **Beecroft Plantation and Thackray Beck, Timble** (SE175538). Meet at 10.30.
Jun	1	Entomological Section Field Meeting at Three Hagges Jubilee Wood, Escrick. Meet at the gate (SE627394) at 10.30.
	10	**VC65 Excursion** to **Freeholder's and St John's Wood, Aysgarth** (SE011887). Meet at 10.30.
	24	Marine and Coastal Section Field Meeting to Red Acre Beach, Seaham. Meet at 8.30 on the beach slipway (NZ431495).
	25	Botanical Section Field Meeting to Fordon Bank. Meet at 10.00 at the crossroads in Fordon. A joint meeting with Ryedale Naturalists and Hull Natural History Soc.
Jul	6	Entomological Section Field Meeting at Three Hagges Jubilee Wood, Escrick. Meet at the gate (SE627394) at 10.30.
	8	**VC61 Excursion** to **Eastrington Ponds** (SE786298). Meet at 10.30.
	22	Marine and Coastal Section Field Meeting to Saltburn. Meet at 8.30am in Cat Nab car park (NZ668215).
	22	**VC62 Excursion** to **Saltburn-by-the-Sea** (NZ668215). Meet at 10.30.
Aug	12	Botanical Section Field Meeting to the Leeds-Liverpool Canal. Details tbc.
	19	**VC63 Excursion** to **Dunford Bridge** (SE157024). Meet at 10.30.

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The Naturalist

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